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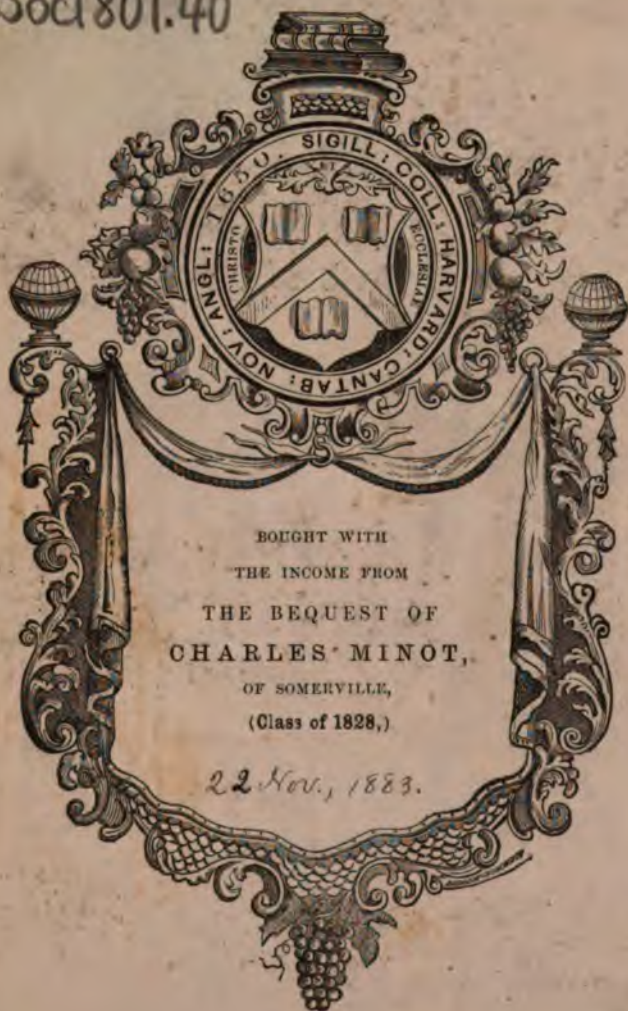
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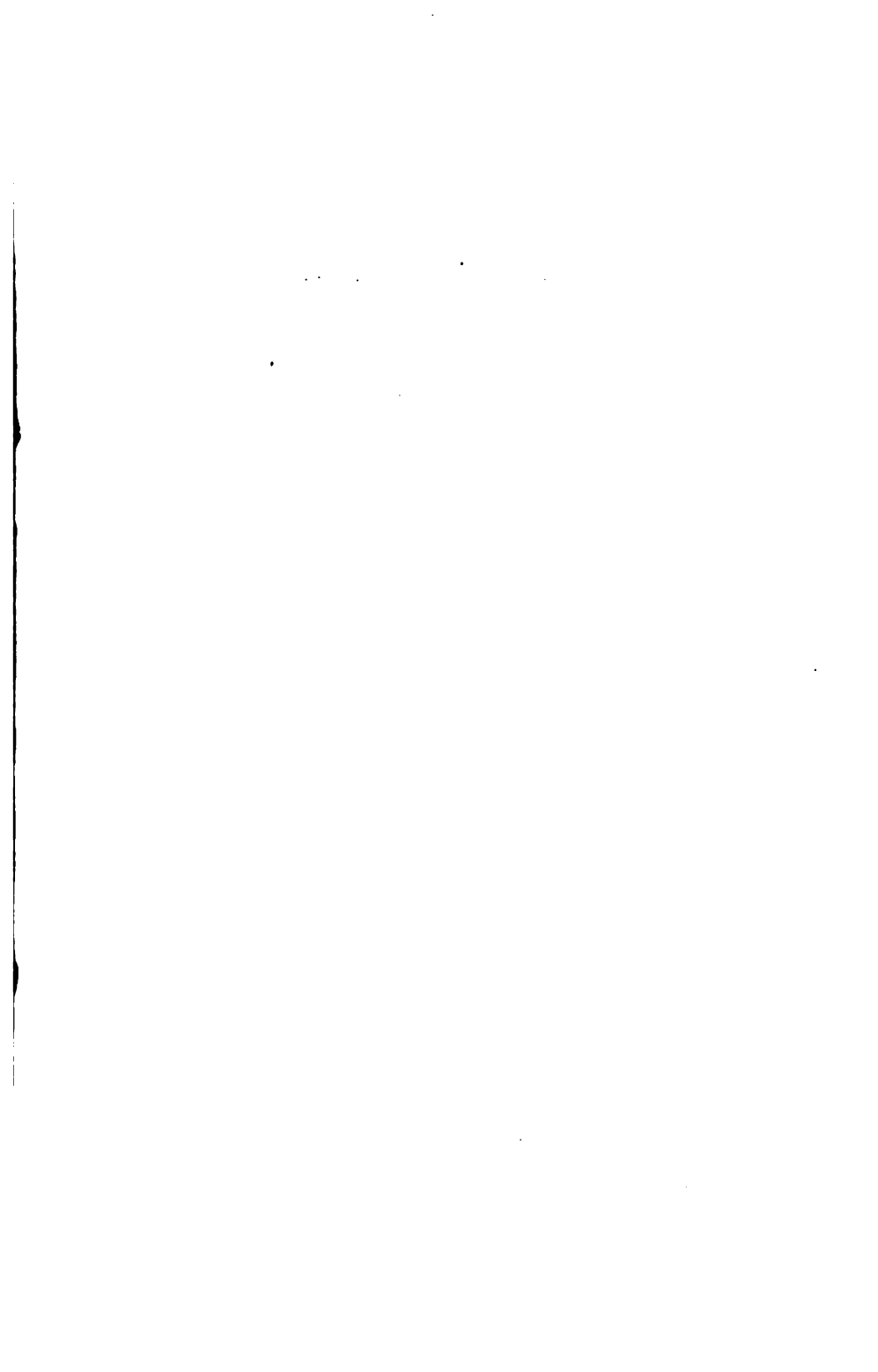
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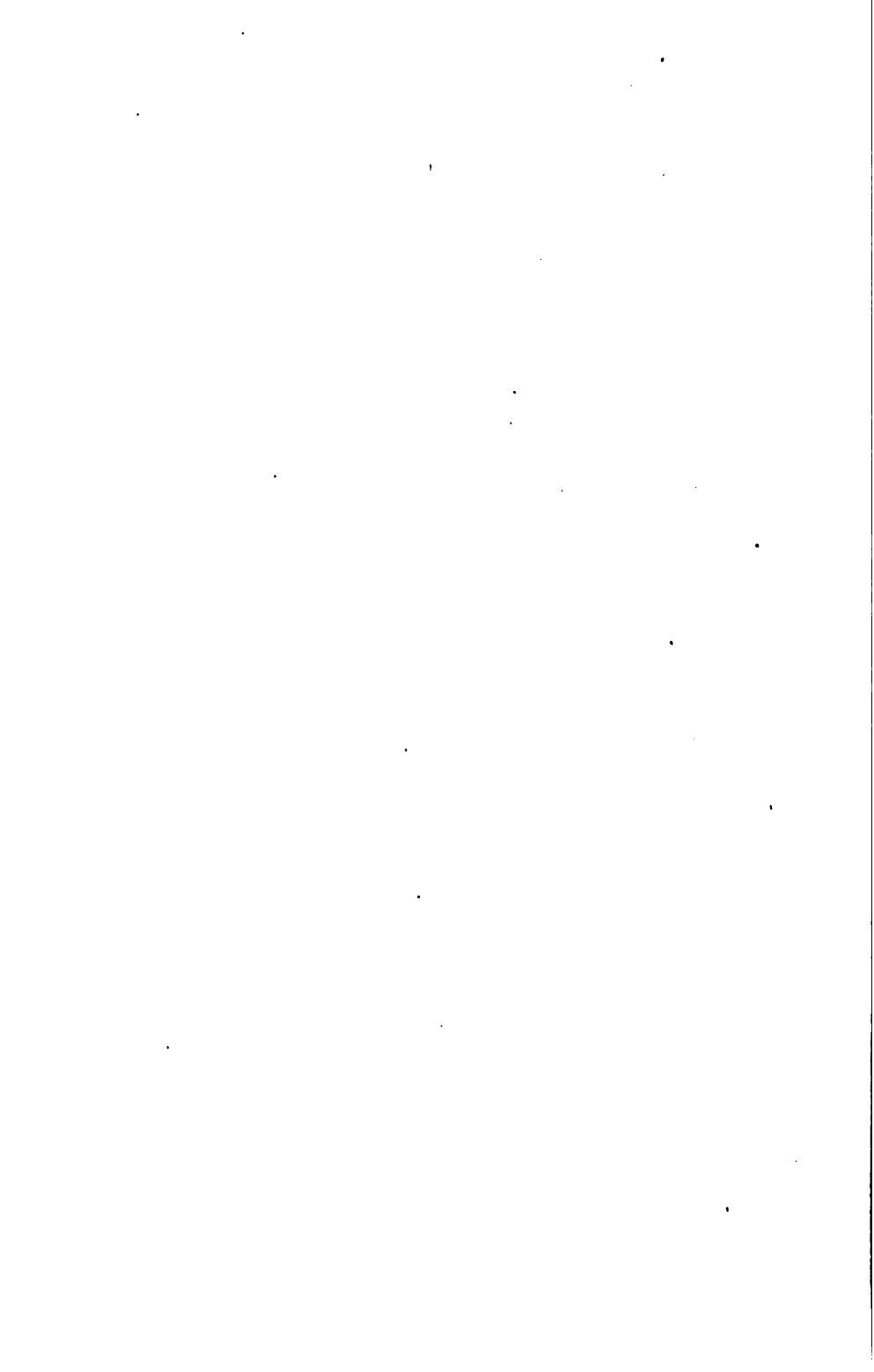


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VOL. III.

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PREFACE.

THE completion of a third volume of the *Journal of Transactions* of the VICTORIA INSTITUTE, with other papers and discussions partly in type which will form a fourth volume, must naturally be a matter of congratulation, not only to our Vice-Patrons, Members, and Associates, but also to those well-wishers who have not as yet joined the Institute. It can scarcely now be doubted that the Victoria Institute has met a want of the day, and already done good work. Now, only the vaguest observations are heard of the oppositions of science to revelation. In the *Essays and Reviews* the charge was clear and specific. In opposition to the Mosaic Cosmogony, the nebular theory of Laplace was boastingly put forward as scientific truth. And, strangely enough, notwithstanding Sir Charles Lyell's frank condemnation of the theory as one "altogether delusive," which had been disproved by the advancement of Geological knowledge, the professed "lovers of truth" still go on hugging their delusion, and issue fresh editions of their crude *Essays*, without apparently any feeling that mere common honesty seems now to demand an open retractation at their hands.

But the most strange reiteration of the nebular theory is that put forth by Professor Huxley, in the first number of the *Academy*, in a review of a work on *The Natural History of the Creation*, by Dr. Ernst Haeckel, Professor in

the University of Jena, and published in Berlin in 1868. But first let me quote the following passage from the last edition of Sir Charles Lyell's *Principles of Geology* (published also in 1868), as cited by Professor Kirk in a paper read before the Institute in February, 1869, "On the Doctrine of Creation according to Darwin, Agassiz, and Moses":—*

"The doctrine of the pristine fluidity of the interior of the earth, and the gradual solidification of its crust, consequent on the loss of internal heat by radiation into space, is one of many scientific hypotheses which has been adhered to after the props by which it was at first supported have given way one after the other."

Those who remember Professor Huxley's discourse in Sion College in November, 1867, will simply be amazed that he is one who even still publicly adheres to the nebular theory, after all its props have gone! In the *Academy* (which is called a "record of science,") he thus writes in October, 1869:—

"Considering that Germany now takes the lead of the world in scientific education, and particularly in biology, Mr. Darwin must be well pleased at the rapid spread of his views among some of the ablest and most laborious of German naturalists. Among these, Professor Haeckel, of Jena, is the Coryphæus." "Full justice is done to Kant, as the originator of that 'cosmic gas theory,' as the Germans somewhat quaintly call it, which is commonly ascribed to Laplace. . . . It is necessary to remember that there is a wider Teleology, which is not touched by the doctrine of evolution, but is *actually based upon the fundamental proposition of Evolution. That proposition is, that the whole world, living and not living, is the result of the mutual interaction, according to*

* *Journal of Transactions of Victoria Institute*, vol. iv. p. 65.

definite laws, of the forces possessed by the molecules of which the primitive nebulousity of the universe was composed."

The nebular theory is here acknowledged to be the basis of "the fundamental proposition of Evolution" or Darwinism; and in the same article Professor Huxley goes on to say:—

"The Teleology, which supposes that the eye, such as we see it in man or one of the higher *Vertebrata*, was made with the precise structure which it exhibits, *for the purpose of enabling the animal which possesses it to see, has undoubtedly received its death-blow*"!

Darwinism, it will be observed, here claims to have given the death-blow to "the argument from design"; and Professor Huxley further tells us that Professor Haeckel "points out that the assumption that *spontaneous generation* has occurred is also a necessary part of the doctrine of Evolution." To believe in Darwinism, then, requires an *à priori* belief in the hypothesis of spontaneous generation, in the absence of any proof whatever of its possibility, and also a belief in the nebular hypothesis, "after all its props have given way one after the other!" The Biology of Professors Huxley and Haeckel is thus seen to be at issue with Geology, with scientific induction, and with facts!

But I must pass on to notice one other most important matter bearing upon our discussions in the Victoria Institute. In the *Times* of this date will be found a notice of Dr. Carpenter's Report to the Royal Society of the deep-sea explorations conducted on board H.M.S. *Porcupine*, by Professor Wyville Thompson and Mr. Gwyn Jeffreys, during the past summer and autumn. The results, Sir Charles Lyell frankly declared in the Royal Society, involved a fresh "revolution in Geology." But I can only cite the following brief passage here:—

"Over the whole warm area explored, the bottom of the sea was found to be covered with globigerina deposits—that is, *with animal life actively engaged in the chalk formation.*"

This is a most important discovery, and affords a complete justification of the interrogation I ventured to put to Professor Huxley when he lectured on the chalk "deposits" in Sion College two years ago,—namely, "whether he believed or knew that the foraminifera of the Atlantic ooze are merely deposited when dead (for he had spoken of their 'exuviae'), and by simply sinking down in that condition to the bottom of the ocean; or whether he thinks, or knows, that they are still alive at the bottom, and propagating their species there." He gave me no reply; and I fear he then did consider it "merely absurd to suppose that the foraminifera are actually now breeding at the bottom of the Atlantic,"* as I said in my paper, in reply to the learned Professor, read in the Institute on 16th December, 1867. But the Professor, after all, was wrong; and the result of these deep-sea soundings proves how philosophic and truly scientific is the attitude of the Victoria Institute, in refusing to accept every temporary scientific opinion as "science," without full and impartial investigation.

J. REDDIE, *Hon. Sec.*

NOVEMBER 23RD, 1869.

* Vide *Journal of Transactions*, vol. ii. p. 324.

JOURNAL OF THE TRANSACTIONS
OF THE
VICTORIA INSTITUTE,
OR
PHILOSOPHICAL SOCIETY OF GREAT BRITAIN.

ORDINARY MEETING, JANUARY 20, 1868.

THE REV. WALTER MITCHELL, M.A., VICE-PRESIDENT, IN THE
CHAIR.

The Minutes of the last Meeting having been read and confirmed, the name of the following new member was announced :—

Richard Mullings, Esq., Stratton, near Cirencester.

It was also announced that the undermentioned book had been presented to the Institute :—

On Inspiration : its Nature and Extent. By the Rev. C. A. Row, M.A.
From the Author.

The Rev. Mr. TITCOMB then read the following paper :—

ON THE ANTIQUITY OF CIVILIZATION. By the REV.
J. H. TITCOMB, M.A., *Mem. Vict. Inst.*

THE early history of civilization is so completely pre-historic, that our only pathway of research into it is through the somewhat entangled mazes of archæological remains, of language, and of mythology. The evidences supplied out of these materials are, it must be frankly owned, somewhat indirect; as, however, they are only to be drawn from such materials, we must make the best of them.

To the purely Christian student there is, no doubt, another source of authority, furnishing him with more direct and

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positive evidence; for it seems scarcely possible to read the Word of God in faith, without coming to the conclusion that a knowledge of musical instruments, and of all kinds of workmanship in brass and iron, was perfectly common in the world before the days of Noah.* Indeed, how could the ark have been built according to its recorded dimensions, without an extended knowledge of the arts which belong to civilization? Again, how could Cain have "tilled the earth," or Adam have "dressed the garden and kept it," without mechanical contrivances of some kind? The horticultural and agricultural operations indicated by these terms are without any specific meaning, if Adam or Cain had nothing to dig up the soil with, but their fingers or the branches of trees. This, however, is not the main line of evidence which I propose to take up in the present paper; for although the resting on that ground *alone* may be very satisfactory and grateful to the devout student of Scripture, yet it lacks that basis of scientific and philosophic thought, which it is now necessary to stand upon in view of free inquiry, and to reconcile which with Scripture, is, I believe, one of the first as well as wisest objects of our Institute.

Let us look around upon the earth, therefore, apart from any records of divine revelation, and examine the conditions of mankind, in regard to moral and intellectual culture. On the one side we behold races both ancient and modern, possessed of refinement and civilization; on the other side, races, both ancient and modern, marked by manifest barbarism. The question is, which condition of things is entitled to priority? Have primeval barbarous races worked up their way to civilization by successive stages of progress? Or, have races which were primevally civilized and refined, dropped, through successive stages of degradation, into a state of barbarism? A solution of this difficult problem is one of the most interesting and important topics that can be presented to us. So much so, that anything which tends to throw light upon it becomes valuable.

For my own part, I think I see evidence of a scientific character in favour of the second of these theories. Let me introduce it without further preface, by pointing out to you *existing* races, amongst whom a higher level of civilization than that which they now possess was once undoubtedly apparent; races which, though they may not have dropped into actual savageness, have nevertheless,—even within the historical period—greatly deteriorated, and degenerated. We may

* See Genesis iv. 21, 22.

instance some of the Dutch colonists in the South of Africa. Take for example the *Vee-boers*, or Graziers, the most uncivilized of the European settlers in the Cape districts;—often individually possessing as many as 5,000 acres, yet living in hovels, fit only for savages. Of these huts, or hovels, the leading features are, “a clay floor” (in the pits of which are splashes of sour milk, or mud)—“a roof open to the thatch,”—“a square hole or two in the wall for windows,”—“and an old rug or blanket separating the sleeping apartment.” As for furniture, its inventory is—“a large chest, which serves as a table at home or a seat in a waggon,”—“a few rickety stools with bottoms of the thongs of sheepskins,”—“a bedstead or two of the same fashion,”—“an iron pot and a few dishes.” Meanwhile the children of these people run wild among the Hottentots; and outside their wretched dwellings lie heaped up accumulations of cattle-dung, which they seldom, if ever, care to remove.*

Our argument, in this case, is from the less to the greater. We say, if the representatives of a civilized and refined people in Europe, by thus being cut off from contact with civilization in a strange land, can thus deteriorate and degenerate; and if this degradation can take place within the history of our own times;—how much more likely were similar and far more exaggerated results to take place in earlier periods of the world’s history, when civilized races were separated from their parent stocks, and left to struggle on in isolated seclusion among difficulties of climate and nature, without any incentives to self-respect, and without any external aids to the recovery of their forfeited inheritance?

Other causes have produced similar effects, such as long and devastating wars, and chronic periods of civil discord. This has been the case with Abyssinia, the present state of which is savage compared with its condition in ancient times, when Axum, its capital city, was filled with obelisks having Greek inscriptions, and bore evident marks of a fair civilization. Gibbon tells us that, in the sixth century, the vessels of Abyssinia traded to the island of Ceylon, while seven kingdoms obeyed its king.† And that, when the Roman emperor Justinian sought an alliance with the Abyssinian monarch, his ambassador was received by him in all the trappings of state, being covered with gold chains, collars, and bracelets, richly adorned with pearls and precious stones.‡ Contrast

* *Bell’s System of Geography*, vol. iv. p. 73.

† Gibbon’s *Decline and Fall*, vol. vii. p. 342.

‡ *Idem*, p. 343.

this with the modern condition of the country. The accounts given of it by Bruce show the rudest barbarism. He describes murders and executions as frequent. He seldom went out without seeing dead bodies in the street, left to be devoured by dogs and hyænas. While raw flesh was the favourite food of the inhabitants, which they ate with the blood still warm in the veins. Nor is the state of the country under the modern Emperor Theodore one whit better; if possible, rather worse. "His troops," to use an expression of Dr. Krapf's, "are like an immense band of tinkers." His towns are a mere collection of reed and mud cabins.

Here, then, is the existence of a race which has visibly degenerated within the historic period. I say a race; for, although the ancient Ethiopic and the subsequent Amharic kingdoms were in some respects distinct, their ethnological unity is sufficiently traced, both by the affinities existing in their languages, and by the fact that both of these are far more Semitic than African.*

Our argument, therefore, is once more from the less to the greater. We say—if a nation can thus be shown to have fallen in its civilization, and to have become so deteriorated and degraded that it has lost all order of government, and every mark of morality and self-respect—although, throughout this process of disintegration, it has been sufficiently near to countries in a high state of civilization for all purposes of self-improvement; how much more is it likely that tribes which, in pre-historic times were civilized, should have gradually dropped down into barbarism, when they fell into fierce and bloody conflicts among themselves, and occupied positions in which they may have had no close contact with other tribes superior to themselves.

This argument is the more forcible because it is impossible to state the converse. Our opponents cannot show that any savage races have now risen up towards real civilization within the historic period; unless, indeed, they have been instru-

* Many other minor instances might be enumerated. Some of the Snake Indians of North America have become degraded into far deeper barbarism than they displayed a hundred years ago, by the tyranny of the Blackfeet tribe, who, obtaining guns from the Hudson's Bay Company, shot numbers of them down, took away their hunting-grounds, and have driven them to live among the hills, without huts or houses, where they now subsist on roots of the earth, under the name of Digger Indians. Then there are the Bakalahari tribe in South Africa, mentioned by Dr. Livingstone, who are degenerated Bechuanas; once having possessed large herds of cattle, but now reduced to a struggle for bare existence.

mentally renovated by means of colonization, or missionary effort, like the Sandwich Islanders and New Zealanders. The issue has often been raised on the one side, and has never been fairly met on the other.

Our *preliminary* position, therefore, in this controversy stands thus. As far as any testimony is to be gained from the facts which have been recorded, either by our own experience or by authentic history, races once civilized have a natural tendency to deterioration and barbarism, whenever they are separated from the rest of mankind, and are left to the debasing influence of their own evil passions; while races, once thoroughly degraded and rendered savage, have a natural tendency when left to themselves to remain so; seldom, if ever, showing symptoms of self-culture, or advancing to civilization.

Hence, simply reasoning upon the condition of pre-historic times, from facts which come within the range of actual experience and history, it seems far more logical to conclude that primeval man was first civilized, and afterwards became degraded, than that he should have been originally savage, and have subsequently become self-elevated. We are quite willing to allow that this reasoning is only in the direction of what is probable. It is not positive and decisive. In a complex question of this sort, however, where all the evidences under review are necessarily imperfect, we must be content with a general balance of probabilities. Let us now see how these arguments from probability run, when we leave the course of authentic history, and get among antiquarian remains, and mythological or traditional beliefs.

We are sometimes pointed to the discovery of flint implements fashioned by man, which have been found lying with the bones of extinct animals in gravel beds and caverns, as well as to other evidences of human antiquity; all of which, it is alleged, stand in immediate connection with primeval barbarism.

But this conclusion is by no means necessary. For, putting aside the question of excessive antiquity, which it is not my purpose in this place to discuss, the mere fact of our discovering such extremely pre-historic remnants of barbarism carries along with it no necessary negation of a contemporaneous epoch of civilization. Have we not a stone age still existing in this the 19th century of our Christian era? Are not flint implements and stone weapons now synchronous in Polynesia and other parts of the world, with the highest forms of civilization in Europe and elsewhere? Have we not, therefore, a perfect right to argue that, inasmuch as the

present co-existence of civilization and barbarism furnishes us with no positive evidence touching which of the two was primeval, so the past co-existence of these in any age, however remote, can just as little settle the question?

That civilized races lived upon the earth long before the dawn of authentic secular history, no one can doubt. Lepsius found hieroglyphic signs of the stylus and inkstand on Egyptian monuments of the 4th dynasty of Manetho,* which, though it can scarcely be reckoned as coming within the range of authentic history, represents a period in Egypt coëval with the time of Abraham. It may be quite true that this old Egyptian empire, the mere existence of which (apart from Scripture) we only know through monuments, and lists of royal names preserved in fragments of lost literature, together with traditions handed down to us from the Greeks, was preceded by a lower state of civilization. We are quite willing to believe, on the authority of Herodotus, that Menes, who stands first in Manetho's list of dynasties, founded the empire by a consolidation of inferior sovereignties, when the Delta and Thebaid were independent provinces, and the state of society was much more imperfect than it became afterwards. This, however, is no proof that the previous inhabitants of Egypt were uncivilized. If we are to judge of that by the late discoveries of enterprising travellers in Chaldaea, Bashan, and Nineveh, we have no reason for believing that the nearer we draw to a remote antiquity, the further we are removed from civilization. On the contrary, the recent excavations at Mugheir, conducted by Mr. Loftus and Mr. Taylor, have brought to light the name of Uruk, king of Ur, of the Chaldees, whose temples were gigantic in size, with their angles facing the cardinal points, indicating science as well as civilization; and whose reign is placed by Rawlinson before the time of Abraham. How singular that modern research should thus be in harmony with ancient Greek tradition; which, so far from placing inferior races of men at the beginning of the world's history, traces back chronology from an iron age to a brazen one, from brazen to silver, and from silver to golden! (*Hesiod.*) Granting that this is both poetry and mythology; yet how strongly does it confirm our own conclusions! If the original races of mankind had raised themselves up from a state of barbarism and misery to one of luxury and civilization, is it not likely that a tradition of this kind would have been preserved? Human nature is much more prone to self-exaltation than self-depression. The fact, therefore, that

* Bunsen's *Egypt's Place in Universal History*, vol. i. p. 8.

not only has no such tradition been handed down to us, but that one of the wisest and most polished nations of antiquity has given us a tradition of the very opposite character, ought not to be without its weight, when we consider the modern theories of an uncivilized origin of man.

Before quitting this part of the subject I may be allowed, perhaps, to refer to certain archaeological remains still existing in certain places. Those of Egypt and the giant cities of Bashan have been already alluded to. To these might be added the splendid remains found in Ceylon, Central America, and even the islands of Polynesia. I am fully aware that as a mere question of antiquity these latter ruins bear little comparison with the former. They show, however, that there is a tendency in the human family, under certain conditions of existence, to fall from civilization. The great tanks of Ceylon, for example, and the ruined city of Anarjapura belonged to an age when its native princes were enabled to lavish untold wealth upon edifices of religion, to subsidize mercenary armies, and to fit out expeditions for foreign conquest—not improbably in the times of Solomon. Excepting the lake Moeris, in Egypt, no similar constructions formed by any race, whether ancient or modern, exceed in colossal magnitude the Tanks of Ceylon.* The architectural remains of Central America are no less suggestive of the fact that many of our earliest records of past epochs stand connected with civilization rather than the opposite, as may easily be seen by consulting Mr. Stephens's *Travels in Yucatan*. Polynesia, too, would tell the same tale; as Mr. Ellis shows in his *Polynesian Researches*. To give only one instance: Easter Island abounds in the remains of once magnificent structures, erected of stones cut and laid together with the greatest precision. The summits are often crowned with colossal statues, some not far from 30 feet high, and 9 feet in diameter.†

But let us proceed to another branch of evidence. I spoke just now of the Greek tradition of a Golden Age. It reminds me of a vast field of mythological inquiry, the details of which are in every respect most interesting, particularly that department of it which shows the manner in which monotheism underlies every system of idolatry. This is very striking, and affords us one of the strongest presumptive arguments, that the nearer we draw to the primitive condition of man, the clearer and more highly intellectual were his conceptions of

* Tennent's *Ceylon*, vol. ii. p. 430.

† Ellis's *Polynesian Researches*, vol. iii. p. 242.

Deity. Aristotle, in one place, draws this contrast between the dark polytheism of his own day and the purer knowledge of older races. He observes :—

It has been handed down to us from very ancient times that the stars are gods, besides that Supreme Deity which contains the whole nature. But all other things were fabulously added, for the better persuasion of the multitude, and for the utility of human life and political ends, to keep men in obedience to civil laws—as, for example, that these gods are of human form or like to animals.*

When Plato, therefore, called the Deity “the Architect of the World,” the “Creator of nature,” “The first God;”—when Pythagoras spoke of Him as “All in All,” “Light of all powers,” “The beginning of all things”;—and when Thales declared, “God is the oldest of all things, because He is Himself unmade,”† we are not to regard these sayings as sudden flashes of genius, or as gradual developments of truth unknown to preceding ages. On the contrary, they cropped up among the perversions of later heathenism, just like granite peaks among the ranges of more modern rocks, testifying of an underlying basis of truth, which savoured much more of primeval civilization than barbarism.

The same great fact may be traced in the mythology of ancient Egypt. The nature of the idolatry which marked the monumental era of that country is too well known to be noted. They worshipped monkeys, beetles, and crocodiles. Yet Plutarch, in his book upon Isis and Osiris, alludes more plainly to an underlying and earlier national belief in one Supreme God. He says, “The end of all the religious rites and mysteries of the goddess Isis was the knowledge of that First God who is the Lord of all things.” Speaking also of the worship of the crocodile, he shows that at first it was merely meant to be symbolical of this one Supreme and Invisible God; because the Egyptians believed the crocodile to be the only animal living in the water, which, by having its eyes covered with a thin transparent membrane, could lie still beneath the surface, capable of seeing, yet itself invisible,—“a faculty,” says he, “which belongs only to the first God—to see all things; Himself not being seen.”‡ This is extremely interesting, and shows how the purer and more refined faith preceded the later and more degraded.

Pass from Egypt to India, the idolatry of which is extrava-

* Aristotle, *Met.*, lib. 14, cap. viii. p. 483.

† Preserved in Laetius, lib. i. 35.

‡ Cudworth's *Intellectual System*, vol. i. p. 563.

gant to the last degree, and whose ritual is a complete subversion of common sense. Retire, however, for a few moments behind the comparatively modern forms of Hindoo mythology, and enter into some of its more primitive recesses. Look, for example, into the ancient Vedas; and observe in how much more pure and refined an atmosphere of thought you at once begin to stand. Everywhere throughout these sacred books there is a distinct acknowledgment of one Supreme God, whom they style Brahm; describing Him and invoking Him in terms of almost inspired wisdom. Take one description of Him as a specimen of many,—

Perfect truth, perfect happiness, without equal, immortal, absolute unity, whom neither speech can describe nor mind comprehend, all-pervading, all-transcending, delighted with His own boundless intelligence, not limited to space or time; without feet, moving swiftly; without hands, grasping all worlds; without ears, understanding all; without cause, the first of all causes.*

After this quotation I need say nothing more. Sounding out like a voice of holy protest against the grotesque and hideous idolatry of more modern Brahminism, does it not speak to us, from the remote ages of the past, of primitive truth and primeval civilization, rather than of rude and savage barbarism?

The same conclusion is forced upon us, whether we will or not, in reference to the ancient empire of China. We have every reason to believe that before the introduction of Buddhism into China, that country was comparatively free from idolatry. There exists, for instance, a very ancient Chinese work entitled Pokootoo, which extends to sixteen large Chinese volumes, containing several hundred pictures (copies of many of which I have seen myself)—pictures of vases, jugs, bottles, of the Shang, Chow, and Han dynasties, comprehending a period of 1784 years B.C. Now, it is very remarkable that out of nine hundred illustrations of such vessels, no small portion of which were expressly intended to be used upon the temple altars, there is not found one which contains any idolatrous mark. This fact is in beautiful harmony with the testimony of Martinus, who wrote a learned history of China, and who tells us that during that long period “they used neither images nor figures to excite the devotion of the people; because, as the deity was everywhere present, it was impossible, by any external image, properly to represent Him to man’s senses.” Bellamy, too, in his *History of all Religions*,

* Coleman’s *Hindoo Mythology*.

tells us that the ancient Chinese divided their sacred book, *Shuking*, into five parts; in one of which God is described as "Independent, Almighty, a Being who knows all things, the secrets of the hearts not being hidden from Him." (p. 184.) It is plain, therefore, that in China, no less than in India, Egypt, and Greece, the earliest forms of heathen mythology and philosophy were the purest. Thus we have a cumulative proof going on among the oldest of the known nations, that the nearer we draw to the fountains of primeval life, the closer we come to times of mental culture; and that, so far from arriving at an aboriginal state of savageness, the probability is increased of our approaching step by step towards a state of primitive civilization.

If we pass from the old world to the American continent, we find exactly the same state of things. Pure primitive monotheism underlies all its mythological creeds. Even in ancient Mexico, where thirteen principal and two hundred inferior gods were worshipped, under images of the most fantastic shape, and with a ritual of superstitious cruelty, the Spaniards found a Being recognized, named Teotl, who was regarded as "invisible, incorporeal, one God, of perfection and purity, from whom springs life and thought."* In Peru the same divine unity was worshipped under the name of Varichocha, "the soul of the universe,"—whose assigned attributes were no less lofty than those given to the Indian Brahm, or Egyptian Kneph. He was called "Supreme." They seldom mentioned his name, and then with the greatest reverence; they built him no temples, and offered him no sacrifices, for they worshipped him in their hearts, and regarded him as the unknown God.† In Central America and Yucatan, the same supreme deity existed under the name of Stunah Ku, or Hunab Ku, "God of Gods"—"the incorporeal origin of all things."‡ It would also seem that this abstract idea of a supreme unity existed among the totally savage, as well as semi-civilized nations of America. Thus, among the Auricanians, he was called Pillan, a word derived from Pilli, the soul. He was termed "the Great Being," "the Soul of Creation," "the Omnipotent, Eternal, Infinite."§ The Californians worshipped him under the name of Niparaya, "the Creator and Sustainer of all things." I might easily enlarge the enumeration if it were necessary; but this form of my argument has been sufficiently maintained. I therefore now pass on to another line of evidence; viz., Language.

* *Clav. Hist. Mex.*, vol. ii. p. 2.

† McCulloch's *Researches*, p. 317.

‡ Squier, *Amer. Researches*.

§ Molina, *Hist. Chili*, vol. ii. p. 75.

I will not insist upon the fact that all our present European languages, with the exception of a few, are cognate with the ancient Sanscrit, the richest and most polished of all languages : a fact which proves that the farther we go back chronologically in that direction, the more scholarly and scientific were the modes of speech then in use. I say, I will not insist upon this ; for, in the first place, it is too well known to need comment ; and, in the next place, it does not recede far enough chronologically to meet the full conditions of the problem to be solved. Europe appears to have been covered by a race, preceding the invasion of it by the Kelts ; a race, which finds one of its clearest exponents in the Biscayans of the north of Spain. It will be more to the point, therefore, if we examine the Basque language, with a view to test ethnologically the condition of, perhaps, the earliest inhabitants of Europe. This language, says M. de Ponceau,—

stands single and alone of its kind, surrounded by idioms whose modern construction bears no kind of analogy to it. Like the bones of the mammoth, and the relics of unknown races which have perished, it remains a monument of the destruction produced by a succession of ages.

What, then, is its character ? There are some languages like the Greek, and its sister Sanskrit, which bear internal evidences of having been perfected, if not originated, among races in a high state of civilization ;—languages, I mean, which are not only rich in their vocabulary, but flexible, powerful, and scientific in their grammatical constructions. How different those just named, for example, when compared with the Tartar family of languages, which evidently originated in a low state of civilization ; being simple in structure, deficient in inflexions, scanty in conjunctions and conjugations, and without auxiliary verbs.*

Not such was the old Iberian, as represented to us now by the modern Basque. Of this language, M. de Ponceau says, “ It is highly artificial in its forms, and so compounded as to express many ideas at the same time.” The two auxiliary verbs, “ *I am*,” and “ *I have*,” are thrown into such a profusion of forms, that every relative idea connected with a verb can be expressed together. It abounds also in inflexions of infinite variety.†

Reverting, then, to the metaphor before used, we put together these linguistic bones of an extinct age, and discovering in them strength combined with grace—and sim-

* Prichard's *Researches*, &c., vol. iv. pp. 404, 405. .

† Idem, vol. iii. pp. 23–25.

plicity united to complex variety,—we infer that they belong to a race which was marked, at some time or other, by a high state of mental culture. So far we enter upon pre-historic ground. But, instead of approximating towards barbarism, we see in it far greater evidences of primeval civilization.

This conclusion may, at first sight, appear to be invalidated by the fact, that races, at present savage, speak languages of the same complex character. It may be urged, that if barbarous tribes now use these forms of speech, the fact of their having been used in pre-historic times can in no way prove that such pre-historic races were not equally savage. But such a conclusion is wholly gratuitous; for we may just as easily, and far more fairly, urge this circumstance in favour of the view that savage races which employ complex and scientifically constructed languages, prove themselves thereby to be degenerate descendants of civilized ancestors from whom these languages originated.

Take, for example, those extremely complicated and artificial forms of grammatical construction which prevail more or less throughout all the American languages, from the Esquimaux to the Patagonians, but of which that spoken by the Delaware, or Lenni-Lenappe Indians, presents the most remarkable proofs. The synthetic form is familiar to us both in the Latin and the English; as "*nolo*" which is put for "*non volo*," or "*never*" for "*not ever*." But these languages are polysynthetic; containing a variety of compounds which are made up of small fragments of single words; such compounds being again mutilated or contracted in order to form other aggregate words. Prichard says, "The extent to which this method of agglutination is carried in their idioms is much greater than is known in any language of the old continent, unless the Iberian be excepted." Take a specimen of it. The Lenni-Lenappe Indians express by one word, the phrase, "Come with the canoe, and take us across the river." This word is "*nadholineen*"; which may be thus analyzed. *Nad* from the word *naten*, "to-fetch"; *hol* is put for a *mochol*, "a canoe"; *ineen* is the verbal termination meaning "us." The simple ideas expressed by these fragments of words are *fetch—in canoe—us*; but its usual acceptation is "come and fetch us across the river in a canoe." Thus a whole sentence is first thrown by agglutination into this polysynthetic form; but this complication is not enough, for after thus being coined into a verb, it is then subjected to further changes by being conjugated through all the moods and tenses, which are very numerous: for example,

nad-hol-a-wall, is the third person, singular number, indicative mood, present tense, passive voice, "he is fetched over the river in a canoe."*

Other specimens of complicated inflexions might be adduced from the Greenland language, in which the multiplicity of the pronouns governed by the verb produces twenty-seven forms for every tense of the indicative mood. *Matarpa*, he takes it away; *mattarpet*, thou takest it away; *mattarpattit*, he takes it away from thee; *mattarpagit*, I take it away from thee. In the preterite of the same verb,—*mattara*, he has taken it away; *mattaratit*, he has taken it away from thee.† "Almost everywhere in the New World," says Baron Humboldt, "we recognize a multiplicity of forms and tenses in the verb, an ingenious method of indicating beforehand, either by the inflexion of the personal pronouns which form the terminations of the verb, or by an intercalated suffix, the nature and the relations of its object and its subject, and of distinguishing whether the object be animate or inanimate, of the masculine or feminine gender, simple or in complex number."‡ It has been well observed that languages of this kind are more like those formed by philosophers in their closets than by savages. How, indeed, is it possible for us to assign even the most remote probability to the theory, that such refined and super-complicated tongues originated among wild and barbarous tribes? Is it agreeable with common sense? Would any man capable of analyzing language scientifically arrive at a conclusion like this, if he were left to an unbiassed judgment? It is not that I wish to press my own conclusions beyond the proper limits of self-assurance; but I venture to say that if these facts were placed before any jury of twelve unbiassed men, their unanimous verdict would be, that language of this kind spoken by savages remains among them only as a bequest and relic of ancestral superiority.

This conclusion is worth more than it seems; for although, at first sight, there does not appear to be much connection between primeval man and even the most remote ancestors of the present American races; yet, upon the principle that, in successive migrations of mankind from an original centre, that wave of population which went forth first would be pushed furthest, this people may not unlikely be among the best surviving specimens of the very earliest period of the world. That period we believe to have been an epoch of primary civilization; by which term, however—let it be understood

* Prichard, vol. v. p. 309.

† Humboldt's *Travels*, vol. i. p. 314.

‡ Id. ib.

—I do not mean an epoch of refined and perfected knowledge like our own, in which art and science are laying all nature under tribute to promote the happiness and serve the interests of mankind. This high state of knowledge has been only reached by a long course of gradual development, and is, no doubt, much in advance of anything that ever belonged to primeval man. But that is no reason why man's original condition should have been savage. On the contrary, the whole balance of probability (apart from Scripture testimony) lies on the side of its having been one of considerable culture;—of culture, at all events, sufficient as a starting-point for civilization, because capable of providing for the necessary wants of nature, and of transmitting to posterity a primary knowledge of the arts which regulate the laws of human progress.

Yet, while man's possession of civilization was in this way capable of development, we hold it to have been equally liable to deterioration—of deterioration, moreover, which, when it fell beyond a certain point, left him without any power of self-recovery. In this respect I would compare the civilization of man to the physical constitution of his body. For as the human body, when exhausted beyond a certain limit of weakness can never rally without some external means of renovation, so when the civilization of a race falls beyond a certain limit of mental and moral debasement, it is left without any recuperative power; and unless aided by some foreign nation superior to itself, will continue degraded in barbarism to the end of time. We see in some of the most debased races, trifling relics of this past civilization; as in the iron-smelting in Sumatra, the manufacture of pottery in the Fiji Islands, and the boomerang in Australia. Yet, in spite of such reminiscences of better days, these barbarians are in themselves hopelessly degraded.

But I must add no more. Many fresh thoughts flash like rays of light upon the picture, and tempt us to go wandering forward. But the limits of my paper have been reached. I will detain you no longer. I have offered you these observations as a small contribution towards the solution of a most important problem. I trust they will not be without their due share of weight and influence among our opponents. I desire no less that they may have been interesting and profitable to ourselves.

Captain FISHBOURNE.—As a sailor, it may be thought I ought to make some remarks on the Ark; though the allusion to it in the Paper is but cursory, there is still sufficient to indicate that very extraordinary knowledge and intelligence was displayed in its production, since no large vessels were

built at that time, and her dimensions remain the greatest of any ship ever built; that is, taking, as I doubt not correctly, the scriptural cubit at 25 inches. It is impossible to believe that either the form, the size, or mode of construction of the ark could have been arrived at by any tentative process. It is equally difficult to conceive that without special instruments and special teaching, especially if they had not possessed iron, and the knowledge of working it, Noah could have selected, and have fashioned and put together effectively such masses of timber as were indispensable; nor without special teaching have provided for the carrying safely its peculiar cargo. The author of the paper has mentioned the interesting fact in reference to the oldest monuments of China and India, that they are without idolatrous emblems; this is also true of the oldest of the Pyramids; the argument from which is, that the builders possessed the knowledge of the patriarchs, and, therefore, a revelation of, and true estimate of the character of the living God. It is an interesting fact, hardly sufficiently remarked on, that in all these nations, however degraded, there are sacrifices, with traditions of the Fall and of the Flood, and that it is only as civilization progressed, that these truths, partially obscured, were eliminated. A singular fact mentioned by Mr. Titcomb, is found in the high estimate which the Hindoos form of Brahm. You will find from written publications and in conversation, that a great proportion of men in the present day have not half so high or correct an idea of God as that which those Indians possess.

Rev. C. A. Row.—Although I think the general reasoning of Mr. Titcomb's paper is exceedingly plausible, and although the conclusions seem to be fairly drawn, I must confess I feel considerable difficulty in accepting them, so far as regards the use of a very complicated language by a very barbarous people. We know that when a civilized people become degraded, the language which they use suffers a degradation with the degradation of the people. Let us take Latin, for example. The Latin of the fourth century is very much degraded as compared with that of the Augustan age, the minds of the people having no doubt undergone a great deterioration since that time. In the case of the Greek language you find the same thing. The modern Greeks are much degraded, as compared with their ancestors, and their language also has degenerated. The difficulty, then, which arises in my mind is this: Suppose the American Indians originally had the language and the condition of a high state of civilization, and in the course of ages they got to their present state of savagedom; it seems to me that their language must bear within it very strong marks of the gradual progress to savagedom. That seems to me to be a very strong point. These American languages, it seems, are highly complicated in form, and such as one would suppose could only have been evolved in a high state of civilization; but I want to know whether they do not bear some traces in their structure of the gradual degradation which we find accompanies the gradual degradation of a people. I quite agree with Mr. Titcomb, that all ancient history bears testimony to the very high origin of civilization. I do not see a trace in ancient history of a gradual advance from barbarism, and

it seems to me that the theory which would elevate man from an original condition of barbarism, would involve an immense number of miracles, especially as the progress of civilization was manifested at a very early period. But supposing man to have started from a high state of civilization, how are we to account for his subsequent degradation in so many instances? Suppose he was created with very high and exalted views of religion, and so on; I want to know under what law of human nature the degradation we find manifested in history has been distinctly brought about. The Egyptians have been referred to, and there can be no doubt that Egyptian civilization reached a very high standard at an early period, and it would be impossible to suppose that it sprung from original barbarism. But when I look at Egyptian theology, I find an extensively complicated system, which, if we suppose it arose from savagedom, or the want of civilization, must have taken an immense number of years to have evolved from such a condition. On the other hand, if it arose from a corrupt or degraded civilization, it must have taken a considerable period of time to have produced such a degradation. I admit that the degradation of religion and morality follows a much more rapid law of progress than anything else, but I am fully persuaded by history, that it does take a long period to effect so very great a change. The case of India has been referred to, and we are introduced to the writings of the Hindoos. But I want to know at what period the Pantheism of India originated. The religion of India, and all the oriental religions, were based on Pantheism. Now, Pantheism is a very great degradation from any pure form of religion, and must have taken a very long period to have arrived; for I am satisfied that the religions of the historical period have undergone a very slow process of change. Take the state of religion and morality in the age of the Homeric poems, and again in the time of Pericles, and I do not think it had undergone any process of improvement in the interval. The progress of change is exceedingly slow in the course of history, until you come to the history of Christianity, which, being supernatural, is removed from the catalogue. Take Judaism: I apprehend it took from the Mosaic period to the Captivity to raise up a proper conception of monarchy. The elaboration of a religious system is a slow process, and that being so, and admitting the early date of civilization, we are led into this difficulty, that it requires a very considerable interval of time during which the various religious systems were elaborating.

Rev. Mr. WHITE.—I would merely ask, is it not a fallacy to suppose that a complicated language implies a high degree of civilization? Where you find a language with many inflexions, and a complicated grammar, is it not rather a mark of defectiveness in, instead of excess of, civilization? If it is true that a complicated grammar and numerous inflexions prove a high degree of civilization, then our own language is a very great anomaly, because no language that has yet arisen has more completely thrown away its inflexions and diminished the number of its grammatical forms.

Rev. A. DE LA MARE.—Reference has been made to the deterioration both of the Latin and Greek languages within a definite period of time—say

three or four centuries. But while we have means of testing that deterioration, I do not think we have any means of testing what Mr. Titcomb has brought before us, for we have no literature extant of the languages he has referred to, and which might enable us to trace their improvement or deterioration. To call upon him to explain that more fully, therefore, is asking for that which the circumstances of the case will not admit of. With regard to the complexity of a barbarous language, it does not seem to me that it is to be argued that therefore the people who use it have not had civilized ancestors. The argument might turn the other way, and, could we trace it, we might find that the language had been even more complex originally than it is in the state in which we now find it. With regard to the question of moral deterioration, I quite grant what has been said with respect to it, that it does take a considerable time to effect such deterioration; but I think there is an element which ought to be considered in relation to that point, which has not been mentioned at all in the discussion of the question. We have, as a starting-point, the fall of man; and taking that into consideration, I think it disposes of all the rest that has been urged. (Cheers.)

Rev. C. A. Row.—What I meant on that point was, that I should like to see it accurately traced according to the laws of history, and not upon any theory.

Mr. NEWTON.—With regard to the archaeological remains which have been spoken of as existing in Central America, I should like to mention that they are all, so far as we know, the production of slaves. Although they were the production of slaves, it is very likely that there was a very superior race who had the slaves under their control, and that would indicate early civilization and early barbarism concurrently. This is a difficulty which must be disposed of; and then there is another, that at a very early period it was as much as a man could do to raise his food and provide his own clothing; and unless a certain number were kept on very short allowance, there would be no extra labour that could be applied to those enormous works of which we now see the remains. We live under a very different state of things now, when we can make a machine produce as much work as a thousand men. In ancient civilization I think we are bound to conclude that all the gigantic works of ancient history were the result of slave labour.

Rev. C. A. Row.—I am informed by a friend that at the Paris Exhibition, among a quantity of ancient remains, is shown a painting, or something of the sort, dating from pre-historic times. I do not know whether it is a painting or not, but it contains figures—the figures of several pre-historic animals. I should like to hear somebody explain what is the historical value of such a painting or representation.

The CHAIRMAN.—I heard that there was such a thing in the Exhibition, but I think its authenticity is rather doubtful; at least it ought to have a careful inquiry and investigation. Since Sir Charles Lyell has been converted by Darwin, we find one school of geologists—the Anti-cataclysmal School—desirous of producing all the evidence they can of the antiquity of man. Man's contemporaneousness with the extinct animals, which has

been rejected by geologists for so many years, has now been generally accepted and received. I think the sketch or sketches which have been shown in the Paris Exhibition, require considerable confirmation; but I believe there have been discovered in America the remains of some extinct animal—the mastodon, I understand—and underneath those remains were found cinders, together with arrow-heads and other instruments of human manufacture. At the time of the discovery, however, and owing to the opinions which then prevailed among geologists, the evidence of this, to use a vulgar phrase, was “burked” and laid aside. I think the whole tendency of modern discovery goes to prove that many animals, which were considered to have existed long before the creation of man, really did exist within the human period. I believe the tendency of modern discovery has been to carry back the history of man into geological periods, in which the existence of man was never previously dreamed of. But whether these things are to carry us up to the enormous periods which geologists are now maintaining, is altogether a different matter—

Rev. C. A. Row.—My friend mentioned that in the objects I have referred to in the Paris Exhibition there were several small figures of pre-Adamite animals. He had them in his hands, and his own opinion is that they were genuine. His opinion is worth something, for he is an authority upon such matters.

The CHAIRMAN.—I think there is strong evidence of probability in favour of those figures, but the whole thing requires sifting. By itself it would have very little weight; but it is combined with a vast number of other facts which go to prove that man has lived contemporaneously with the mammoth and the mastodon, and many other animals which have been considered as long anterior to the creation of man. Returning now to the subject immediately before us, I think that nothing I have heard has controverted the main position taken up in this paper, viz., that man did not rise from a savage state by long and slow and almost imperceptible degrees, into a state of civilization; but that there was in the beginning a high state of civilization, from which all history and tradition points out man to have originated. We have been asked, no doubt pertinently, how then we are to account for the rapid degeneration from civilization, which must have happened to certain races. I think, however, that that point was fully accounted for by what was pointed out by Mr. De La Mare—that it is only the revelation of Holy Scripture which throws the slightest amount of light upon a very important historical fact. The fall of man, and consequent deterioration of man's spiritual nature, is the only thing which will account for the very rapid demoralization into which man can fall. To discover how rapid that process may be, we have no need to go among the tribes of India, the barbarians of America, or the low state of barbarism existing in Australia; we need go no farther than our own highly civilized and Christian lands, where those men and women who have been allowed for a short time to follow the natural tendencies of the human mind, and the natural tendency to degeneration existing in the human heart, have sunk, when without the influence of Revelation, into the

lowest type of humanity. In order to see how rapid human degeneration may be, we have only to go into our own prisons to find people existing in the depths of a barbarism quite equal to that which you find in any other part of the world. This degeneration is not merely a historical thing ; it is a fact within our own experience. On the other hand, we find, without the existence of a spiritual religion—without the existence of a highly spiritual form of the Christian religion—how difficult it is to raise those people who are in a state of degradation, up to a high point of civilization ; but when those same men, barbarians of our own country, are brought under such an influence, we see how rapidly even the most degraded and degenerate of our race may be raised to a pitch of intellectual superiority, I may say ; for we may go into the poorest cottage, inhabited by men or women exceedingly unlearned in everything but their Bible, and yet find them able to teach us certain things which we knew not before—far higher truths than were taught by the sages of Greece and Rome, and rising to a far higher appreciation of the Deity than you find in ancient documents or in the books of the Vedas. It is all very well for Max Müller and others to pick out certain gems from the old oriental literature ; but they are but a few seeds of grain winnowed from an extensive amount of chaff. I was recently speaking to an eminent professor of Cambridge, well acquainted with modern Hebrew literature, the literature of the Talmud, the more recent, the post-Christian literature of the Jews. We were speaking of that recent article on the Talmud, in the *Quarterly Review*, which is extremely popular just now, and contains a number of magnificent passages from Jewish writings, collected together for the purpose of showing us that the Jews before our Saviour had as high an appreciation of morality as the writers of the New Testament. But most of the gems there given us are from a literature written many years after the promulgation of Christianity, and after the Jews had had the advantage of the teaching of the New Testament ; and yet it is taken as a proof that all we have in the New Testament was derived from ancient Jewish tradition ! I said to my friend, that I did not pretend to be a Hebrew scholar, and that my knowledge of Jewish literature had been altogether derived from translations, but I have waded through translations of the Talmud and other specimens of Jewish writing, and I found it the most uninteresting and absurd stuff imaginable. I asked my friend's opinion as to the article upon the Talmud, and he said it consisted of a very little wheat taken out of a vast quantity of chaff, but when winnowed and collected together in that way, it appears very wonderful indeed.—One of the main things upon which we pride ourselves in the present day, is the great and rapid advance we have made in science and civilization. But so far as metaphysics and the knowledge of mental philosophy are concerned, I think the ancient Greeks were quite equal as sophists and reasoners to any of the men of the present generation. Since the days of Bacon, however, we have had a new mode of investigating science. We have investigated the facts of nature, and paid attention to them, rather than to the theories to be deduced from them. Take an instance in point. Without knowing anything of electricity or magnetism

—in point of fact our most skilful scientific men know very little about either as yet—you have only to discover that a current of electricity sent along a wire will turn a magnetic needle in one direction, and that another current, sent in an opposite direction, will turn it in another way ; these facts being known, you can construct an electric telegraph. Why, an Indian, a Chinese, or a Japanese, who knows these things, is quite as capable of making telegraphic instruments as we are ourselves. We think we are so transcendantly superior to the men of the past in our civilization, but in all the true essentials of civilization, in all its highest fruits, go where you will into the Biblical record—take Abraham, and his wife and children, for instance—and you will find them as highly civilized as any people among ourselves. We find them far superior in their state of civilization even to the inhabitants of what is called the unchanging East. Although the East is called unchanging, its inhabitants have degenerated in civilization wherever Mahomedanism has obtained the ascendancy. We not only find that, but we find that, under the same circumstances, other portions of the human race would remain very much in the same condition. I was recently reading an account of China, written by a medical man, who describes the Tartar tribes coming into China from the steppes ; and as you read the description, the scene is one so familiar, that you can almost fancy you are reading an account of Abraham coming up into Egypt with all his camels. In Atkinson's works you will find barbarism and civilization combined together ; nomadic races, possessing a high degree of civilization, and possessing a great deal of material wealth, but still living in that nomadic state in which Abraham lived when he went up into Egypt.—I do not think the difficulties which have been raised in this discussion with regard to language are so strong as might be supposed. Supposing we admit them to be objections, I think they still tend to favour the main argument of Mr. Titcomb's paper. We are taught that our own language in its present state has been derived from the Sanskrit and other cognate languages. If we were to enter into modern theories as to the formation of language, we must admit that our language, powerful and useful as it is, capable of expressing the highest spiritual truths, capable of discussing all the philosophy of the past in the strongest and clearest terms and all the achievements of modern science—instead of being improved has degenerated. We have lost all our inflexions : all the verbs have got into an antediluvian state, if I may so call it ; we have dropped all the suffixes of our verbs : we have not even approached the state of agglutination ! It may be that language has a tendency to pass through revolutions : I can hardly understand how any savage race, being in a state of barbarism, and supposing that race always was in a state of barbarism—for that is the point I want to fix your attention upon—I can hardly understand how any such race could evolve such a system of language as many barbarous races possess—a system such as we, with all our modern notions of the history and structure of language, could hardly elaborate in the study. The same sort of thing has been pointed out with regard to the Chinese language. Arch-

bishop Wilkins proposed a universal language, not phonetic, but ideographic—an idea suggested by the analogy of the mathematical, chemical, and astronomical symbols; we know that the most complicated problems connected with the integral and differential calculus, for instance, can be read by the people of all nations. He conceived the idea, then, of inventing an ideographic language; but, had he been acquainted with the Chinese language, he would have found one which had been in use for many generations, probably the oldest of the languages we have. All these things tend to prove that man has not originated from a state of barbarism, and then risen to civilization; but that, wherever man has been found in a state of barbarism, it is barbarism arising from degenerated civilization. This is confirmed by the fact that we find no traces of any people possessing a literature and having any knowledge of their past history who have not some tradition amongst them of their having been raised from barbarism by a people more civilized than themselves. The Greeks admitted that they were taught by the Egyptians and Indians, and you find the same thing among the Mexicans. There is another curious thing which ought to be pointed out. Many of what we would suppose to have been the most extraordinary inventions of modern times have an antiquity which goes beyond all historical knowledge. For instance, the discovery of the compass goes beyond all historical recollection in China. The use of a needle suspended by a thread for guiding men across the steppes of Tartary has been known to be in existence in China beyond the date of all historical testimony. A great deal has been said with regard to the stone age, the bronze age, and the iron age, as having been successive stages in the progress of civilization. But, as Mr. Titcomb has pointed out, we have the same things contemporaneously now, and because they are found, it is not at all a proof that one was anterior to the other. The art of obtaining iron from the ore—requiring a considerable knowledge of chemistry and metallurgy—dates back beyond all historical knowledge. It has existed time out of mind. In the interior of Africa, only a few hundred miles from the Cape, men have been found doing in miniature all our most complex metallurgical processes for the production of iron, to obtain iron from the ore. Again, the art of converting iron into steel has been known time out of mind. This is one of the most recondite things in the whole range of chemistry, scarcely understood yet—The art of submitting two substances to an intense heat, and incorporating them in order to produce another substance different from either of the other two—this has been known in India time out of mind. It may be asked, How, then, do you account for the fact that while all this has been known throughout Asia and Africa, it should never have penetrated into America? In answer just suppose this case for a moment:—Suppose fifty or sixty English sailors, born and brought up in a purely agricultural district, were shipwrecked on a desert island. How many of them would have the most remote idea, in the first place, that the ore which they might find contained iron, or if they knew that, how many of them would know how to extract the iron from

the ore? Consider this case and you will see how rapidly knowledge once acquired may be lost and never recovered by a people. Another remarkable thing is the universal acquaintance of all the races of the old world with the cereals and the mode of cultivating them. This is a most remarkable thing. Where will you find wild wheat or rice capable of being cultivated into the grain we now possess? Where do you find the great staple food of the whole world growing indigenous? Botanists admit you cannot find them anywhere, or, if instances are given, they are extremely doubtful and nowhere abundant, and we feel almost certain that unless man cultivated these cereals with the care with which he does, our "staff of life" would soon go out of his hand. All these things point back to a remote period of civilization, when man was already acquainted with several things which we now conceive to be the products of human thought, human science, and human invention. (Cheers.)

Rev. J. H. TITCOMB.—From the discussion which has taken place, I find that there are three principal objections to my paper. The first consists mainly in the length of time which we must postulate in order to attain to that state of moral and religious degradation to which certain races have arrived. With regard to religious degradation, I think the objection cannot have much weight when we bear in mind the short space of time which has sufficed for the rise and spread of Mormonism, than which it is impossible for the human mind to conceive anything more outrageous, absurd, and degraded. The rapidity with which men have been found to embrace Mormonism presents a fair type of what one may conceive might have happened in the earlier periods of the world's history, when various races were more entirely cut off from each other than are even the Mormons at Salt Lake from all connection with their fellow-men. I might mention another instance to bear out my view, in the case of the origin of a certain sect in Germany at the break-up of the Papacy at the period of the Reformation, and again in France at the time of the Revolution, when the mind of man ran into the wildest extravagances, and when a certain sect arose known by the name of Adamites, the very fundamental theory of their association being that everybody should go about in a state of nature! Such a notion indicates a total and utter degradation of religious feeling and sentiment, and shows, I think, that such degradation does not require any great lapse of time for its completion at all. But if the objection requires a still further answer, I would say, take the state of society in a part of England, in the county of Cornwall, in that period of the eighteenth century before Wesley arose, whose ministry was so purifying and elevating to the miners and wreckers of the coast of Cornwall. I would undertake to say that if we had the evidence of a committee of the House of Commons upon the moral degradation which existed amongst that race of men previous to their elevation through the sanctifying influence of religion, we should have a record of facts which would make our hair stand on end, and of a nature impossible to speak of in the presence of ladies. Conceiving that to be possibly true for the moment—and I believe it could be thoroughly substantiated

—we have in the present historical period the picture of a body of miners existing deep in the bowels of the earth, without the blessings of Revelation, and closely approaching the condition of the utter seclusion of the savage races of man from their parent stocks. You have in the one case, then, almost as large an amount of moral degradation traceable as in the other. It is hardly necessary, therefore, to postulate long periods of time for that degradation. Another objection made to my paper has been on the score of language. The gentleman who made the objection says that language degenerates with races. I quite admit that there is no use in attempting to bolster up an argument if it will not stand, and I should be the last person to make such an attempt. I only wish my arguments to be tried on their merits, with the sole object of eliciting that which is true. American languages have been referred to. Now, it should be borne in mind that American languages are distinguished by two main features: the one is their tendency to agglutination, and the other their complicated grammatical construction. My friend asks, seeing that Latin in process of time degenerated with the decay of people, and became unworthy of its ancestry, how was it that the native American languages could be preserved by savage races, and should not be rather degraded languages than cultivated and refined? I am quite willing to admit that there has been deterioration, and that that deterioration is found existing in agglutination of words; but I think the traces of the civilization which belonged to the older languages have been faithfully preserved in their grammatical construction. You must be extremely careful to distinguish between these two branches—agglutination and grammatical construction. Max Müller himself says that agglutination indicates a low rather than a high state of language; but that is nothing to the purpose. You can easily conceive the American languages not being agglutinated before in their earlier history, but still having the same complicated grammatical construction. The agglutination exhibited in the American languages, then, shall represent your part of the argument; the complicated grammatical construction represents mine; and therefore, while your view may be a true one—and I do not at all deny it—I may be equally correct in maintaining mine—

The CHAIRMAN.—I can give you an instance of the truth of both these views in our own country. When I was in Yorkshire, in the neighbourhood of Sheffield, I found the process of agglutination going on with great force, as in such a phrase as “on t’road,” for “on the road.” At the same time that this agglutination goes on, a complicated grammatical construction may be retained. Among those very people, old Saxon verbs with the old Saxon terminations are still retained; as in the verb “to lig,” for “to lie;” “liggin on a bank,” for instance, instead of “lying on a bank.” That I think is a very good example of the argument.

Rev. J. H. TITCOMB.—It is also contended against my paper, that because English and Greek, and all the Indo-European family of languages, have a tendency to become simplified rather than to get complicated by time, as compared with the older Sanskrit, that therefore the refining and purifying influences of civilization in America should have made the American languages more simple

rather than complicated. I answer, Max Müller has so devoted himself to the Aryan branch of philology, that I do not think he has sufficiently grasped the thought, that it must be with languages as it is with habits and customs and other things—you must allow for different races different kinds of genius. In the whole of the Aryan languages, stretching from India to Iceland, you have a tendency to simplify—that is the genius of race. But that is no reason why the Mongolian family should not have a different genius, and their genius, even in civilization, may have a complicating tendency. That is quite conceivable, and is as much in accordance with the rules of common sense as any other theory. The objection raised by Mr. Newton is urged on another ground. He finds a difficulty in the existence of slavery in these primitive times. He says, with reference to certain archæological remains in Central Africa, We know they were made by slaves, *ergo*, there must have been barbarism side by side with civilization. That proves that barbarism is as old as civilization; *ergo*, your paper is wrong. But I contend that slavery has no kind of connection of necessity with barbarism. The Greek slaves were not barbarians, neither were the Israelites in Egypt. The opinion of those who have studied the monuments of Egypt, and who are competent to speak on the point, is that most of those monuments were the work of Israelitish slaves. In the monuments dating as far back as the fourth century, there are figures of slaves at work, and they are represented, not as of the black or negro race, but with regular Jewish faces and features. Slaves may exist side by side with civilization, but not necessarily as barbarians. They are degraded, it is true, because conquered; and I can conceive the Mexicans taking hold of a conquered race and reducing them to a state of bondage, without their being in a state of savagedom. If that is true of the Egyptians and the Israelites, it may be true of the Mexicans, and of old races contemporaneous with the Aztecs.—I have now disposed of all the objections which have been raised against my paper, but I have been rather disappointed that there should be so few. I anticipated more, and, with your permission, if I have not already wearied you, I will raise a few myself, and endeavour to answer them. Nothing has been said to-night with respect to the argument deduced from Monotheism. I expected some one would have said it is in vain to appeal to any underlying substratum of religious belief on the side of Monotheism, as that would prove nothing, because it is only a natural instinct of the human mind to worship a pure spirit, and that it is only, *a priori*, to be expected in all parts of the world side by side with idolatry. But we have evidence to the contrary. For instance, the Kaffirs stand out exceptionally in Africa as being without idols, and as worshipping a pure spirit. You cannot show of the Bushmen and the Hottentots that they have any notion of a pure spirit. Another objection has also struck me. Granting that races now savage have fallen from a state of civilization, that does not prove they were aboriginally civilized, but only that they have fallen back into their original state of barbarism. It may be that in their present state they have only fallen back to that from which they originated, like domesticated plants and animals, which, when left without cultivation, revert to

their original types of wildness. This argument may do very well for wild animals, because all their improvement is confessedly *ab extra*. As they never raised themselves, so, when their artificial supports are withdrawn, they naturally drop back again to their original level. Indeed, they often drop lower than their original level. For example: the European swine, first carried by the Spaniards, in 1509, to the island of Cubagua, at that time celebrated for its pearl fishery, degenerated into a monstrous race, with toes which were half a span in length. Our analogy is of the latter kind. Just as the domesticated swine of Europe did, in this instance, fall below the natural level of the wild hog of America, so our present savage races represent a lower level of mankind than that which was originally their standpoint. One analogy is as fair and good as another. But the truth is that neither is compatible with the facts of the case, for wild beasts do not become raised by their own unaided powers—it is not by development, but by the tuition of a superior order of beings; whereas man rises in civilization by the cultivation of his own natural powers, both mental and moral. Granting this, then all true analogy between the cases must fail. When man raised himself up to the civilization of ancient Greece and Rome, it was only by a progressive cultivation of his physical, mental, and moral nature. Correspondingly, when man fell to the level of the Digger Indians in America (supposing them to have had a civilization previously, which is our present platform of argument) it must have been by a progressive deterioration of his physical, mental, and moral nature. The question we have to decide is this—Whether the starting-point of man's development toward 19th century civilization was like the condition of Digger Indians in America, so that he may be considered to have raised himself from the extreme lowest point to the extreme highest; or was it somewhere intermediate between the two, from which central point some races have risen higher and others fallen lower, merely by the cultivation or non-cultivation of their natural resources? In contending for the latter point, we have by far the larger induction of facts in our favour, drawn from the analogy of contemporaneous history: These facts and analogies are so plain and perspicuous, that I honestly confess, if there were no Bible in existence, I should still hold my own opinions as the result of simple scientific inquiry. I will conclude, if you will allow me, by reading a passage from Max Müller:—"More and more the image of man, in whatever clime we meet him, rises before us noble and pure from the very beginning. . . . As far as we can trace back the footsteps of man, even on the lowest strata of history, we see that the divine gift of a sound and sober intellect belonged to him from the very first, and the idea of a humanity emerging slowly from the depths of an animal brutality can never be maintained again." (Cheers.)

The Meeting was then adjourned.

ORDINARY MEETING, FEBRUARY 3, 1868.

THE REV. WALTER MITCHELL, M.A., VICE-PRESIDENT, IN THE
CHAIR.

The Minutes of the previous Meeting were read and confirmed ; after which it was announced that the following books had been presented to the Institute, viz. :—

Plain Sermons for Perilous Times. By the Rev. W. Niven, B.D.

From the Author.

Thoughts on the Kingdom of God. By the same.

From the Author.

The Victory over Death. By the same.

From the Author.

The following Paper was then read :—

LIFE : WITH SOME OBSERVATIONS ON ITS ORIGIN.

By J. H. WHEATLEY, Esq., M.V.I., Hon. Loc. Sec., Sligo.

THE grand economy of nature is laid bare by science, to an extent inconceivable by our fathers. Yet by the independent study of organic and inorganic nature, the introduction of life appears to be involved in impenetrable obscurity : and with all the skill, and all the industry, and all the talent, which have been applied to investigations of the heavens and of the earth, of the visible and of the invisible—what is the result but degradation, and defeat, and monstrous deductions, and absurdities rising above absurdities—the whole crowned by infidelity—if the vivifying breath of the Eternal be disallowed ?

A proposition is very plainly put by Professor Huxley in expounding the development theory :—“ Given the existence of organic matter, its tendency to transmit its properties, and its tendency occasionally to vary ; and given the conditions of existence by which organic matter is surrounded ; that these, put together, are the causes of the present and of the past condition of organic nature.”

This really sounds like a grim jest, at the expense of mathematics ;—given everything to find everything ;—and

from these premises are deduced that the past was what it was, and that the present is what it is. We may hardly dispute the conclusion.

Grant everything that does exist, or ever did exist, and there is nothing to deduce but the method of descent;—on which subject much eloquent writing has found its way into circulation; and, though it has been elaborated with great abilities, copiousness, and perseverance, what reliance can be placed on any hypothesis of descent, where the cause of the introduction of organisms is ignored?—where the source of vitality is unacknowledged?—or where homage is paid to the dead framework of creation, as the parent of all the living glories we see?

Allow that we can trace back all the complications of form, manifested in us and around us, to a cell for the vegetable kingdom, to an egg for the animal kingdom, and these to a primordial unit—will this unit represent all the phenomena? We are of, and from, the inorganic, but not by it. The clay is there; but where is the Potter? The entire of the visible is from the inorganic—whether of the most intricate complexity or simplest cell—though much of it is built up by an independent power. But, notwithstanding that the visible is from the inorganic, is, also, that which animates the smallest portion of the visible? I believe not. It may be well, therefore, to attempt to show—

That it is not sufficient to grant the existence of organic matter, with its transmitting and varying tendencies, and the conditions of existence by which it is surrounded—in order to establish true deductions;

That the origin of life was not through any of the means to which we apply the term, natural; such as chemical combinations—electro-magnetic or other forces; that, in fact, from the inorganic the organic could never—through the agency of the inorganic alone—proceed;

That neither from geology, nor from any other science, can we glean the real history of life;

But that it is, nevertheless, required to know and to explain—to have a true and perfectly clear and comprehensible conception of the origin of existence—in order to establish the true relation between the various phenomena of nature; and I do most honestly believe that the plain speaking of science and the plain speaking of the Bible are parallel roads; along either of which, or both of which, the highest scientific student and the lowliest believer can walk with equal profit and honour.

Life assumed, we can bend it to subserve almost any

hypothesis; but if its origin be acknowledged, our flights of imagination and our scientific inquiries will necessarily fall into accordance with our cognizance of what that origin is calculated to effect.

The strangest of modern instances which sustains the position that assumed life will sanction almost any hypothesis, is the derivation of man, by the developists, from the lowest forms of life. According to these, man began his career, it is difficult to say where. They track him, however, to the sponge; thence to the star-fish or sea-urchin; thence to the limpet or lobster. An osseous structure next falls upon him: he becomes invested with fins and scales—lo! man is a fish. Subsequently he rose to the dignity of a reptile; he hissed in the serpent or croaked in the frog. Then feathers appeared; and he took to pecking grain and grubs as the crow, or tore flesh as the eagle. In due time, down he came from the regions of air—fur sprouted where feathers grew—and he was found, either burrowing underground as the mole, or springing from branch as the nimble squirrel, or preying upon what was once himself as the otter; but which of these does not seem to be quite clearly made out. Passing upward, he appeared in his present form as the child of an ape; or, to account for diversity of race, at least three monkey mothers were concerned in the prodigy or progeny;—both, indeed.

Hence, we see, man was not created at all; but “grewed” like poor Topsy—grewed, gradually, from vegetable to intellect; mind—the intelligence to will and to do—having wriggled itself out of a fucus, or some such thing; and appeared on the stage of humanity—intellect, speech, and all through the monkey medium. I don’t think we are anywhere told how it was that the first monkey-man was not both first and last of his race.

The development theory is a fair illustration of what may be imagined under life assumed, without reference to its origin. A latitude is thereby afforded for all kinds of absurdities; and, instead of a steady research, under control, the mind is apt to wander off into the very burlesque of science. I only allude to this fanciful theory, to show the necessity for a thorough understanding of the introduction of life:

Different attempts are made to set up some sort of origin for the living. Time is by some quoted as an indispensable element in the production of life. Old *Edax Rerum* has a task assigned him directly opposed to his usual labours. Instead of the reaper, he is the sower of the seed. Instead of remorselessly mowing us down, we are his cherished offspring. Geology, very modestly, requires millions of years. Allow but

this for nature's preparatory course of study, and she manufactures life through the agencies of electricity and chemistry; perhaps aided by occult forces of which we know nothing. She bestows, likewise, determinate forms.

According to others, when the physical world was prepared for the living, "life pressed in," the conditions being suitable. Pressed in—where from? how came the life to be? And how came it to be at hand, just in the nick of time? It must have come from somewhere; it must have had previous existence. Whence came it? and what was that previous existence? No matter; it pressed in; and that is, doubtless, satisfactory to the theorist.

But all are not content with this sort of off-hand proceeding. For instance, they call in the aid of chemistry and electricity. "It may be," says Professor Huxley, "that it is impossible for us to produce the conditions requisite to the origination of life; but we must speak modestly about the matter; and recollect that science has put her foot upon the bottom round of the ladder." This is passing strange; for he himself, in another place, quotes M. Pasteur's experiments, to prove that there is no such thing as spontaneous generation; and gives in his adhesion to that doctrine. He adds, however, that it in no way interferes with the possibility of the fabrication of organic matters, by the direct method to which he referred—chemistry. If so, I confess I fail to understand what is spontaneous generation. Surely, life resulting from chemical processes—supposing the production possible—could only be by bringing together the necessary ingredients, in the proportions required, and under the conditions demanded—when life would spontaneously appear. If it be pretended that spontaneity signifies an arising at its own will—voluntarily—in fact, self-evolving—still, what do these phrases mean? They all presuppose existence before manifestation.

In these three last words—existence before manifestation—lies the great mystery of life. Life must have been for life to be. Who pretends to explain how life comes to be before life was? We have heard and read much assertion that so it is;—but may we be allowed to ask for the evidence? If Professors Huxley or Tyndall, or any other man of science, will favour us with reasons why or how matter can produce what it does not possess, it would greatly facilitate a settlement of the question. Matter may form, by the agency of elemental disturbances, the shape of a pig; but where is the grunt to come from?

In relation to life, matter is nothing. Life is independent of matter. This is plain; for the tissues dissolve as soon as,

and not before, life has departed from them, nor can matter detain life at its will; therefore, *ex nihilo nihil* applies to the argument of matter evolving life;—otherwise it has evoked a force it cannot control, for it has no more power to eject life than to preserve it. And as we cannot conceive such a thing as the maker subordinate to the made—inasmuch as the producer infers higher intelligence than the produced—does not this conflict with nature-creation of life? as no one, I apprehend, can reasonably dispute the inferiority of the inorganic kingdom to the organic. Moreover, it is not denied that organisms are formed out of the material world. Vital power builds up matter into flesh and blood, and bone, and muscle, and hair, and feather, and fur, and scale, and every organism on the globe. Produce the agent, in matter, that can do this. No. Well, but you have as much right to assume that natural forces set up the living fabric, as I have to assume a vital power. I think not. Let us sit down to the microscope, and I show you the gradual development of forms where vitality is, with all the marvellous effects of its stimulus on the material body; show me what we call natural forces, at the same work at which I show you vital power. You cannot! have your natural forces the power to instruct me how the mechanism is calculated to perform, which I have shown you in operation? No. Since, then, they cannot point to so much as one creative act—one smallest vestige of anything proceeding from their own volition—why do you call upon us to grant them the power to elaborate all the wonders and complexities of the living? When you can place before us the most trivial self-advance in the inorganic, as under the microscope, I place before you the action of life on the most insignificant atom, our respective evidence may be taken to be on a par; but until you can, there is eye-witness on my side, against assertion on yours. Which would the jury convict?

Again—where, in all nature, do we find the inferior producing the superior? Where, in all creation, animate and inanimate, does the stone give us bread? Can we point to one instance of the globe, with its rock and its soil, and its so-called imponderables, and the whole of its inorganic constituents, improving itself? Can we find matter working?—holding up before us independent power? Can the skeleton of our planet unfold this to us? Can the dry and the sapless clothe themselves with flesh and with leaf? Can we point to one single instance of even vegetable or animal rising above its original? Until we can do this, is it not a little premature to credit that which has not life—and of whose improve-

ment since its creation there is no record—with the vast step in advance of giving birth to the wondrous world of the living? I may go further; Mr. Page says in his work on Man:—"No observation from the external world—no analogy, however plausible—no analysis, however minute—can solve the problem of an immaterial and immortal existence." Exactly so. And though Mr. Page is an opponent of the views I am endeavouring to maintain, he has uttered a broad and indisputable truth. Since, then, immortality is the prolongation of life to endless duration, there is precisely the same impossibility, from the external world, to solve the problem of the first condition of immortality—life. As immortality cannot be without life—and as nothing like immortality can be made out of the inorganic—they who say at the same time that the inorganic can produce life, contradict themselves. Perhaps they can reconcile this. I confess I am too obtuse. I have already considered that it is physically impossible for the perishable to confer immortality; and that it is consequently impracticable for life to have been the fortuitous offspring of merely natural forces. Does not even perpetual motion defy the skill of the highest organization on earth? Yet insensate matter is called upon for perpetual life. *Cras credo*, as Dr. Jortin said of Swift's learning.

To show the impossibility of chemistry being competent to effect the production of life, it is perfectly well known to chemists that there are peculiarities of composition in organic substance and structure, marking it off from the rest of creation by a deep and a wide valley, across which no human arm can throw a bridge. There are many elementary substances found in organic matter, the whole of which are not, however, present in all organisms. The four principal do pervade all that is organic, hence commonly called organic elements;—they are oxygen, hydrogen, nitrogen, and carbon. The presence of those in the organic is universal. They are also of the inorganic: and thus far, being common to both, why may not the one produce the other? the lifeless, elaborate life? The peculiarities of their distribution forbid it. The elements generally form a binary combination in minerals; but in the organic world, at least three—usually four—of the elementary principles, enter into combination to form the proximate principle—to educe each simplest substance. We have also, in the inorganic, the elements commonly united in a simple ratio to one another; as 1 atom of the one kind to 1 or 2 or 3 of another; while in organic bodies there is no such uniformity; several volumes—ten or a dozen—of one, unite with some

of each of the others, toward the making one compound atom.

Now since the same elements are found, forming constituent parts both of that which has, and that which has not life, why should their combinations so greatly differ? why should one remain dead matter, and the other assume the almost infinite varieties of living forms? I do not see how we can account for this, by any elemental action, *inter se*. The activity which produced the material universe, could only, by the exercise of the same means, continue to produce the material. The material, therefore, can but throw off varieties of the material—can but effect architectural changes. There must, consequently, be some power at work, independent of, and beyond, the inorganic components. Dr. Beale calls this the vital power; and uses some very strong arguments in favour of its distinctive operation. I believe it is vital power, which, as well as the common inorganic forces, sprang from the same agent—a Power above both.

But why should not the means which established the inorganic have suddenly changed on the completion of that work, and endowed it with the property of producing life? This would be the employment of other means;—that is to say, it would be changing what was already made. Nature affords no warrant for assuming change of any kind. The external world of to-day is the external world of the past. The form alone changes; the substance is unchanged. May it not, then, have been endowed, from the first, with life-creating power? Here we come back to the arguments of the inferior producing the superior—which, in the whole range of nature, I apprehend is unknown.

It would seem, therefore, that life itself was the cause of the great difference between the elemental combinations of the two creations—organic and inorganic: and though we are acquainted with the constituents of both, and their combinations, we cannot introduce life into the inorganic, nor can we extract life from it.

Cuvier says, "Life, exercising upon the elements which at every instant form part of the living body, and upon those which it attracts to it, an action contrary to that which would be produced without it, by the usual chemical affinities, it is inconsistent to suppose it can, itself, be produced by these affinities,"—an old argument, and none the worse for keeping.

The unceasing chemical changes of the body are unmistakably subsequent to the introduction of vitality into structureless matter; and dependent upon it. Life is,—and the hour

in which it was first seen for ever interposed an impassable gulf between that portion of creation which felt the living breath of the Eternal and that which was destined to remain inert.*

If life can be generated by the inorganic—of course, it produces the forms of the living. Crystallography has been appealed to as evidence that nature does evoke regularity of shapes from the shapeless; and that man can imitate nature with her own materials. It is quite true. Nature's only regular form is the crystal; and though there are several primaries, and a multitude of secondaries, they are all solid bodies, having plane and smooth surfaces. In carbonate of lime, for instance, these secondary forms are amazingly numerous. Pseudomorphous forms arise; but the laws of crystallography are for all practical purposes irrefragable.

This science does not appear to yield very satisfactory evidence in favour of what we may call Artificial Life. Crystals are made, artificially, through electric agency; and it is hardly possible to conceive anything more distinct from the forms of organic bodies. The crystal is a solid with plane surfaces;—and the organized structure, from the lowest and most simple examples to the highest and most complicated—whether plant or animal—has a more or less membered form, whose boundaries are curved lines, and whose surfaces are either concave or convex,—as widely different from crystallization as arctic from tropic.

Does it follow that, because we can make one of nature's products from nature's materials, we can make the forms of life, which we have no right to assume nature itself ever made? Even could we find the most remote trace of such a thing, our making the insentient crystals would by no means infer the capacity for producing other forms, at such an immeasurable

* Dr. Odling's *Animal Chemistry* has just come under my notice. I hope, hereafter, to give a more detailed reply to this, and one or two other works of strong materialistic tendencies. The only observation there is now time to make, is, that on casually opening the work just named, I came upon the following passage. Speaking of vital force, Dr. Odling says,—“So far as I can make out, it seems to be a sort of internal, intransferable, immeasurable, self-originating power.”—I believe it to be internal, not intransferable, immeasurable, not self-originating. If this view be correct, any train of argument, founded on Dr. Odling's idea, must be utterly inconclusive; there being no more evidence of self-originating vital power than of self-originating matter.—I think before any argument can be raised on self-origination, a definite meaning should be given to the phrase. It would avoid much misconception; and, if I mistake not, greatly simplify the present question.

distance from those we can make, as the distinction between living and dead. If we could even do this, how are we to perfect the work by infusing the vital principle?

When the electric force is brought to bear on chemistry, may there not be better hope of success in the attempt to make life? Admitted that electrical action and chemical action bear direct relation to each other—that during the decomposition of each equivalent of a compound, a constant quantity of electricity is evolved—any speculation on the chemical and electrical action on each other is immaterial. It suffices that the electric force works in conjunction with the chemical elements. To my mind, the experiments of M. Pasteur most conclusively negatived those of Mr. Crosse and Mr. Weeks, who found a species of *acarus* appear in solutions of nitrate of copper, silicate of potash, and ferro-cyanate of potassium—on which a powerful battery was brought to bear. A pretence of creative power was thereupon sought to be established. May there not be an attempt to prove rather too much here? Three distinct solutions, acted upon by electricity, each disengaged the same form of life. If the forces employed, the solutions used, and the surrounding conditions, are all precisely the same, to the greatest possible exactitude, it is quite comprehensible how the same creature should appear, supposing that any could. But it is surely incredible that by the employment of various media, the same animal appeared, unless on the supposition of the introduction of germs from outside.

Mr. Milton, speaking of the relation between electricity and the vital power in connection with the human frame, says, he thinks it possible, "that under certain circumstances, the one becomes the other." I do not understand how this can be. We cannot argue from any abnormal condition of the frame; but taking the whole to be instinct with life, the nervous system will interfere with that theory; for the arrangement of the nerves is such that there does not appear to be any perfect circuit; wherefore, as electricity has no means of circulating, it cannot, under any concurrence of events, ever become life where the nervous system is part of the organization.

Let us turn for a few minutes to geology; for though it makes no pretension to account for the origin of life on the globe, it yet deals somewhat liberally with successive re-introductions of life.

It can hardly be disputed that the earth's strata are volumes of deep learning—studies worthy intellectual man. But, for the most part, its expositions go far beyond its real

teachings. Fancies and fallacies flit about thick as motes in a sunbeam. Their inventors are of those who imagine that two and two make five. They are spendthrifts of generalization—often jumping to conclusions on very meagre data. They insist that the evidences of geology are conclusive of other systems of organic life having passed away, and been replaced by new creations. Yet, teaching this, (to me, false doctrine,) they go far toward contradicting themselves; for, without geology, I can scarcely understand how we could, scientifically, prove the similarity in all cases, and identity in some, of present existences with the earliest past known.

We learn much from it. We learn that chemistry and electricity were the same in time's former day as now. We find precisely the same elemental proportions in the earliest known formations as in the latest. The law which regulates crystallography, too, is unchanged. The crystals of the oldest rocks are identical with the modern. The rocks furnish us also with evidence that the physiological laws are unchanged; they tell us that death and reproduction have ever been the same; that respiration and nutrition have always depended upon the same organs and the same constitution of the atmosphere; and the comparative anatomist testifies that the laws of his science were then as in the later ages. We might therefore rationally conclude, that the animal kingdom would supply the same great classes. And so it does. The four leading divisions are fully represented—the vertebrates, the molluscs, the articulated, and the radiated. After observing that the three lower divisions greatly preponderated over the vertebrates of the olden time, Hitchcock says, "thus we find, that the more perfect animals have been developed gradually; becoming more and more complex as we rise in the scale of the rocks. But in the three other classes, there does not appear to have been much advance upon the original types, although in number and variety there has been a great increase." The inference here is, they were either developed from inferior forms or in the way of new creations; neither of which do I think the witness of geology warrants. The facts seem to be truly detailed. In the lower strata there are no vertebrates, save a few fishes, and certain tracks of possible batrachians. In the oolite, mammals appear. In the tertiary, they are more plentiful; at present more plentiful still. Without inventing new creations, or "cudgelling the brains" for any hypothesis of development, to account for the geological order—the task would have been quite as easy, quite as philosophical, and it seems to me infinitely more natural, to have argued up to a widely different conclusion, namely,

that vertebrates (with the exception of fishes—and perhaps next, of batrachians) multiply much slower than the inferior tribes. Their fossil remains must therefore, of necessity, be very much fewer in the ages when life was young, increasing by degrees as the world waxed older; till, in these latter times, they have expanded into growth, proportionable to lengthened existence. Fishes are of all vertebrates the most prolific; a fact which may not unreasonably be supposed to account for their traces, at an earlier date than their more slowly multiplying contemporaries. The greater the number, the better chance of specimens being preserved through the revolutions of at least 6,000 years—or, at any rate, of being found; for it must not be forgot, that it is little more than an infinitesimal part of the earth's surface which has yet laid bare its secrets to the persuasions of the geological hammer.

The extinction of genera may seem to lend something like a sanction to the renewal of life, by new creations. But it is only seeming. If one single example were found of a persistent form, through all the geological ages up to the present time, the *necessity* for new creations would be at an end; as others may be detected on more extensive examination; or, if utterly destroyed, might still have continued had the economy of nature required it. Many, certainly several, instances of this perseverance are found. Sir C. Lyell, in commenting on Mr. Davidson's monograph on the British Brachiopods, names four genera of molluscs that "still retain in the existing seas the identical shape and character which they exhibited in the earliest formations." So the necessity for new creations is not very apparent.

I believe I am speaking the truth in saying no man of science assumes that since the introduction of man one single new denomination, or race of beings, has appeared; but that mere varieties of existing races—forms of known species—have spread by degeneration; sprung up, if that term be better liked, though "by degeneration" seems to me more correctly expressive. Geology speaks—and speaks truly—of extinct species. Even in our own day, several have disappeared from the face of the earth; the dodo, for instance. And Dr. Guyon gave an account, not long since, to the Academy of Sciences in Paris, of the recent extinction of some animals in Martinique and Guadaloupe, and, indeed, from the West India Islands generally—the anli, a kind of dog; two large parrots; two paroquets; and a species of frog. Of course, species may have fulfilled the intentions of their creation, and become extinguished. This may, and probably does, occur in every latitude where there is life. But where

is the evidence of new creations? Geology points to several. But until it be finally settled that the igneous theory is properly quenched by the aqueous; or whether the aqueous itself have any pretensions to the dignity of upholding the science at all: in short, whether the science, as taught and commonly understood, have a leg to stand upon; until then—until its principles are a little more settled—until, in fact, it has sown its wild oats, we may be allowed, at least, to entertain grave doubts as to the credibility of its teachings when sanctioning plurality of creations. I think they can be very differently accounted for.

To my mind, the error, the grand fundamental error of our geological head-quarters, is not recognizing the former geographical position of the earth's surface, whereby the buried botany and zoology, and the periods when they flourished, have been grievously misinterpreted.

As I have said before, the great divisions of life are there; but for the most part, in the earlier formations, different from later forms. Why so? They are the forms of a tropical land. How then came they into these climates? for sure it is, they neither do nor could flourish here now. What is there wanting wherewith we cannot supply them? There must be something. So there is—a vertical sun. According to the distribution of the sun's glorious rays, so is vegetation, so is animal.

It has been customary to account for climatal changes chiefly by atmospheric alterations, brought about by the great currents of the ocean taking a new course; by sea usurping the place of land, or land that of sea. But with our northern sun, alterations could never account for the lion and tiger in our forests, nor the palms and tree-ferns of the tropics on our uncongenial soil. Hitherto, every change of surface on the globe has been attributed to upheavals and subsidences—an upward and downward movement in the same spot—even to the reversing large tracts of country. And the geological mind has been satisfied with it—has given its best attention to it—has become saturated with it—has assumed hypotheses, and drawn inferences, very much to its own satisfaction;—children of imagination, bright and delusive.

We can understand the sudden coming on of an icy period. Let the gulf stream be deflected from our shores, and a raising of the land take place—a climate might be produced wherein life must give way under its intensely glacial aspect. Ice and snow which no summer's sun could melt—or whose rigour could be even mitigated—would reign undisputed. But so long as our latitude is unchanged, how can we have the heat

of Bengal, the burning plains, the steaming jungles? How enjoy the pleasures and pay the penalties of those districts where lurk beast and reptile of surpassing beauty, and where vegetation rises in all its grandeur? Where else is this to be found? Where else? here, under our very feet are buried races of the tropics. We see it in multitudes of shells; we see it in vast numbers of animals; we see it in trees, having at this hour their roots in the very soil in which they grew luxuriantly under warmer skies, showing the impossibility of their having arrived where we find them by any accidental occurrence—any convulsion of nature. Long is it since the beams of a sun which did this have ceased to visit our land.

It is even so. Then how did they get here? The answer to that question involves the utter destruction of the fundamental doctrines of geology, as hitherto taught. In the present state of science I do not think any man would be justified in pledging himself to the truth of the reply. There are, however, some very strong reasons in its favour.

Geology has not, heretofore, reasonably accounted for the contents of those strata lying below the more recent deposits. That the denizens of a hot climate could never live under our skies is unquestionable. The late Mr. Evan Hopkins advocated the theory that these and many other lands arose from the sea, if not within the tropics, at any rate in such a latitude that the then surface could only bear the tropical plants, and nourish the tropical animals of which we find the rocks bearing such faithful and ample testimony—a very simple solution of seemingly formidable difficulties; and that, too, in strict accordance with our Bible, leaving not one inch of room for conjecture.

Both astronomy and geography point to these northern countries as having once been in or near the tropics. Granting this to be the true means of accounting for our tropical fossils, it is not the most important matter for which we shall have to thank it. Will it not sweep away the whole of that geological mass of assumptions which imputes to the antiquity of the world tens of millions of years? Will it not dissipate the illusion of plurality of creations? The rate of the earth's northerly progress known, the calculation is very simple; and geology's dealings with repeated fresh introductions of life, in the way of new creations, is at an end; they merely become modifications of existences under change of external conditions.

What may be called tropical geology, as telling of all lands having risen in or near the tropics, or having passed through them, shows us both a short chronological career for

the earth, and abundant reason for the changed animal and vegetable life which the rocks disclose to us in their fossils.

Again, on another point, whence could have come the notion that the earth was covered with vegetation and with animal from the lowest forms of life? and even those produced from a vesicle or cell containing the future creature—nay, possibly all from one primordial unit? Most likely because reproduction—all that now exists, or has existed for thousands of generations—all—all—every living thing we see—every living thing, from the microscopic to the most colossal bulk—arises from a tiny germ. This is what we see. But this is not creation. It is the created perpetuating itself. Strange confusion; that creation and perpetuation should have the same origin!—and certain philosophers tell us they have; that the plant, for instance, sprang from a mere point—a nucleated cell. Whatever it may be called, it must contain the perfect plant, which is to all intents and purposes a seed; the thing thence proceeding is therefore reproduced, not created.

I do not understand by what steps philosophy can reach a germ beyond the first plant. If it contain the future plant it involves a contradiction; inasmuch as that infers reproduction. Reproduction proves a progenitor. The first plant could have had no progenitor; therefore the first plant must have been created in a perfect state, and not as a mere atom containing the plant that was to be subsequently evolved.

The perfect plant, then, must have existed before the formation of any minute substance containing itself; otherwise, you would have the astounding incongruity of reproduction before existence. A small nucleated body is the mode of perpetuating. If this body were also the mode of creating—the one and the other being the same thing—we are fighting with shadows, when we attempt to trace the producer from the produced; as in such case they are convertible terms.

What other idea can we attach to a fertile egg, or nucleus, but that of having been generated by a form similar to what it will itself generate? In a natural sense, the plant which produces the embryo of future plants proceeded from a like embryo. In a natural sense, therefore, we cannot point to creation in its embryonic form, its primordial shape. I feel, then, full conviction, that in spite of philosophy—"in erring reason's spite,"—the Revealed Word alone can inform us of the true origin of life.

Nobody can deny an ultimate principle—a first Cause. Creation, as I understand the word, means production by original power. Is the external world—inanimate nature—

original power? If so, this inanimate nature, from the subtilest gas to the densest formation, is existing without cause—which we can conceive of no tangible thing. It is therefore obvious that nature was created. The created cannot create; but only reproduce. Hence, as a mere reproducer, life cannot there have had its origin. Those who deduce life from elemental capacity, invest matter with eternity; which it requires no argument to disprove. Neither does it require argument to prove that the Eternal—as Eternal—must be the great primary cause; and that all besides what is eternal, can only be effects of a cause.

But may not Deity have bestowed on the inanimate the power to produce the animate? I apprehend not; because, since every separate particle of the inorganic is dead matter, how can any aggregation, or combination of dead particles, assume vitality? Pile Pelion on Ossa—and what then? It is only a higher mountain. If we can trace life up to the organic—there we must stop. There ends the track. Nevertheless we recover it. Where? In Revelation; and but for Revelation, I contend we should be utterly in the dark on the subject.

The very word inorganic, as opposed to organic, is framed to show it is neither possessed of animal nor vegetable vitality. If it has been denied life, how can we assign it paternity? The atheist's "fortuitous concurrence of atoms" is hardly so absurd.

In fact, however, a section of modern philosophy does appeal to this very fortuitous concurrence of atoms, for much more than the formation of the material universe. When it arranges certain essences in the chemist's laboratory, and thence announces organic bodies, is it not bringing together by human skill, what it tells us, matter can itself do in the vast laboratory of nature? Unless it tell us this, it is occupied with a mere toy; and if it tell us this, it either invests matter with intelligence, or deifies chance.

Yet man, himself, is of the inorganic? O yes; he is of the dust of the earth;—the dust of the earth did not make him.

But without drifting into Scripture arguments, I would attempt to show—outside the Bible—that the talk about nucleated cells and primordial units, does not account for the origination of life by the inorganic: indeed, that it is impossible the dead framework of earth could have clothed itself with life; impossible that any combination of mechanical appliances, in connection with the agencies of light, heat, and electro-magnetism, could have built up living structure: atoms

of matter which never had life combining themselves into forms possessing life.

Of course, such remarks do not apply to those who shield themselves from an accusation of atheism, by granting that God created some eight or ten forms of life; whence all we see of vegetable and of animal has descended. Even this petty concession appears but grudgingly made. However, a Creator, independent of matter, is acknowledged; and the arguments recently urged against Darwinism, in this Institute, by its Vice-President, Honorary Secretary, and others, seem to me so thoroughly convincing, that it is something very like presumption in me to add to them. I consider that the perfect and complete forms were those created; from which varieties cannot be raised into species. If this be so, not only does it negative the embryonic theory of existence, but the natural-selection speculations of Mr. Darwin. That we must withhold our assent from the former is self-evident; the latter may require a short examination, which, in the present sketch, must be very short indeed.

The vegetable kingdom contains more than 100,000 of these perfect forms or species; the whole of which, according to the natural-selection theory—save four or five at most—have descended from that small beginning of vegetation. This might be more comprehensible, if the 100,000 were only varieties; as although without artificial assistance they will either revert to the normal forms or perish, still there might always be that number, or more, in existence at the same time. But they are species—things reproducing and perpetuating themselves from seed. The few created plants would multiply, and throw off varieties in course of time. They would go on multiplying themselves; while the varieties would gradually disappear, and others supply their places. As man also increased, those varieties which he found useful, or which pleased his fancy, would be preserved and kept on by artificial means: a species would keep itself on. This is judging, both from what we read of past vegetable physiology, and from present experience. I see no grounds for saying that early life on the globe was in any way different to present; which it must have been for the land to have covered itself with 100,000 species descended from so few types.

I have been a grower and lover of plants for very nearly half a century; and, though that is but a point in the world's history, he must be a wonderfully careless observer who failed to notice so striking a curiosity as the establishment of a species from a "sport;" and a variety is nothing else. A hybrid, too, without the intervention of artificial processes,

either reverts to its original, or becomes extinct. Though my own observations are very trifling, they bear out the broad facts, and confirm the generally acknowledged laws of Botany.

With this known inclination of varieties—or, rather, with their known nature—it is hard to say how it were possible, even in the (to me) fabulous ages of the old geology, for the natural establishment of new species from the created few, to have been effected. If varieties could be converted into species, extended time, such as Mr. Darwin requires, seems a most unnecessary step in the process. A variety thrown off by the parent plant is a species at once, or not at all. It is only a temporary variety; for, when it has grown up and become a perfect plant, it must either die out, revert, or perpetuate *itself*. In each case there is an end of the variety. Disappearance, by reversion or death, does not more clearly extinguish the variety than if it perpetuate itself; for in the second generation it is as much an established species as the specific type. Instead, therefore, of the elastic millions of years, called to the aid of the hypothesis in question—a single season in some instances, and only few seasons in any—is all the time for which nature is called upon permanently to set up new species from old. The fugitive character of the plant under observation, or its stability, seems an easy way of marking its rank.

Where man interferes, in the way of improving a species or a variety—such as our culinary vegetables and our florist's flowers—he is obliged to continue by industry what he acquired by skill; else would the size and succulence of his parsnips and his celery, and the glory of his roses and carnations, very soon return to what we consider the insignificance of their originals—neither pleasing his palate nor delighting his eye.

Even from a few considerations such as these it would seem probable that neither the organic nor the inorganic, as independent studies—whether in connection with chemistry, electricity, or geology—afford a glimpse of the origin of life; nor, consequently, the true relation of the phenomena of nature. As far as the great question of life is at issue, all is there dark as a futureless grave. We must look to other sources for the information they are not capable of imparting.

Try history. Professor Huxley says that historically we know nothing about the origin of life. On the occasion when this observation was made, it was in allusion to the history of the rocks. But the general tenor of the lectures in which it occurs is tending toward an application to all history.

But there is one which brushes away every conjecture and every doubt—one which has never been disproved by the most elaborate ingenuity or deepest learning that has ever been brought against it—the Book of our Faith.

The Bible-outsiders may think it hard, or beneath the dignity of mind, to be driven to so plain a record. To me it appears the only one through which we can account for the introduction of life upon the globe, or for the globe itself, in truth, simplicity, and consistency.

Infidelity comes not forward with wit and banter, as it did formerly, and failed; nor with the metaphysical subtlety of a past school, and failed. It now winds its insidious way under the mantle of science—and will fail too. Stripped of its externals, we have, instead of true science, an eccentrically put together and fantastic image of conjecture, girt about with the more pretentious matters of chemical experiment. Its votaries are not few; and the intellectual wealth poured out at its shrine is very considerable. To some minds there is a fascination in the meretricious more intoxicating than strong drinks;—how else could the gifted investigator condescend to such teachings as these? “No competent man of science now believes in Adam and Eve.” “The inroads which science is making in the established interpretation of the Old and New Testaments.” “No organism is, nor ever has one been created which is not microscopic. Whatever is larger has not been created, but developed”—and so on, *ad infinitum*.

One notable instance may, however, supplement the above. An attempt is being made to introduce a “new science,” under the name of “Atomechanics.” It happens that this, or something so like it as to be of the same tendency, was propounded by Swedenborg more than a century and a quarter ago (1734). He says, that in the first finite which arises from the simple substance, there is a spiral motion (proceeding from such tendency in the simple substance), and that, “in the effort of the simple towards spiral motion, lies the single cause and the first force of all existences.” This appears to be identical with the pantogen, or primary chemical principle of the inventor of the new science, M. Hinrichs.

The idealist’s pride of intellect will not bend to seek where it may find. He works in the cause of his nature-deity—the aberrant, uncontrolled, unintelligent. Even though he may not designedly seek to overthrow our faith, but only point out some new paths—from the smooth and trimly-kept, to the savage and the fantastic—I think endeavour should be made to arrest the steps of those who have put foot on the dau-

gerous way, or are, as yet, only listeners to the voice of novelty—so especially attractive to the young, and to the lowly educated.

No manipulation of dead matter has instructed us in the origin of life; nor does there appear the slightest chance that it should. It is, therefore, to living structure we must turn for information; and that confirms the Mosaic history of its introduction; in my humble opinion, at least, the only true theory, the only consistent account we have of the existences of the three great orders—living plants, water animals, and the creatures of earth.

“And God said, Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind.”

“And God said, Let the waters bring forth abundantly the moving creature that hath *life*.” The same term is used in the creation of the creatures of earth.

“And God said, Let the earth bring forth the *living* creature after his kind.” But in the creation of man we are told, that God “breathed into his nostrils the breath of life; and man became a living soul.”

What I wish to bring more particularly under your observation is the distinction made between the creation of plant and all the inferior animals, and between all the inferior animals and man,—resulting in the impossibility of life passing from one organism to another between the three marked divisions of existence.

The plant has a sort of life. It has growth and reproduction. Revelation does not even call this life. But it is remarkable that both water and land creatures are, at their creation, summoned into being as living things.

I said living structure confirmed the Mosaic cosmogony. Is it not broadly outlined here? What was created distinct continues distinct. The existence granted to vegetable, passes not into animal life; improves not upon its Author's impress; transgresses not the boundary marked out for it by Divine Power; can never give unto itself that which its Creator has denied it; and cannot, therefore, transmit other than it received. Hence the zoophyte is an imaginary thing—obscure as may seem the distinction between animal and vegetable in the lowest appearances of the former.

The distinction of creation is again most emphatically marked in the wide gap interposed between man and all other animals. He holds life—and the same kind of life too,—in common with them. But mark the enormous difference: he became a living *soul*, not only living like the rest of the animal

kingdom, but receiving, by direct agency, the breath of the Immortal, constituting him, also, thereby immortal. This distinction was not bestowed upon the inferior animals. Of course the same argument applies here, as between plant and animal, with the additional force of the highest conceivable dignity—that of not only claiming to be, but of being, immortal—the crowning gift of the Eternal, to the master of earth.

The separation of plant and animal appears, then, so prominently marked that, however closely they may externally approximate, the line of separation is as completely impassable as if the one were of earth and the other of the planet Neptune. So, likewise, between man and the rest of the animal creation. The natural impossibility of intermixture between the leading divisions of animate nature, must denounce all theories based on an unknown, or unacknowledged, or speculative source of life, either as mere ingenious hypothetical schemes or premeditated infidel teachings.

Some of our comparative anatomists, however, struggle hard against these marked distinctions. Anything like an impassable barrier is abhorrent to them. Unity of organization is their hope. Even then—is the question of life solved? And the chemist, framing organic compounds from inorganic mixtures, thence argues for the production of vitality; as if a dead organism were more likely to start into life than a dead electrical spark; as if by mixing, and moulding, and transferring forces (always ignoring vitality as a force) this vitality could be generated;—hence, if so produced, subordinate; hence, an inferior power. Life, the inferior power of earth! indeed, not a power at all, but the offspring of involuntary inorganic combinations—the child of blind chance—unmeaning in its lower form, irresponsible in its highest; unmeaning, as an essential quality—irresponsible, as of the unintelligent.

May I venture to beg you to look upon so short a paper as this, on a subject of such extent and deep importance, as only a text for discussion—towards educing some little order from the mass of confusion with which a modern materialistic section of philosophy is overlaying the origin of life on the globe?

On the motion of the Chairman, the thanks of the meeting were voted to Mr. Wheatley for his paper; and a paper ON THE TRIUNITY OF LIFE, by Dr. Edward Haughton, of Great Malvern, was afterwards partially read by the Secretary, and the thanks of the meeting were voted to the author.

[Dr. Haughton's paper is not here printed, as it was not completely read,

and the discussion that follows was confined to the paper of Mr. Wheatley. Dr. Haughton's paper will, however, be published separately by himself. —J. R., Ed.]

Dr. PROTHEROE SMITH.—The subject of the first paper is one that has interested me very much ; but, not being aware what form Mr. Wheatley's views would take, I came here rather to gather a few ideas on the subject than to offer any observations of my own. As the President, however, has done me the honour to call upon me for some remarks, I may say that I find one observation in the paper with which I most fully agree—viz., that but for revelation we should be utterly in the dark on the subject of the origin of life. As by one grand coup, all the rubbish which infidels have heaped together is removed by it, as well as some of the views broached by geologists. We must, in order to form a correct idea of the question before us, go at once to revelation ; and there only we get the true answer to the inquiry, "What is life ?"—a question, I think, one of the utmost importance, because it involves to some extent our conceptions of the Creator. In appealing to those who are ignorant of God it is often said, "Why do you not go to God ? Why are you not more godly ?" &c. ; and it might as well be asked in an unknown tongue, since it is impossible to form a notion of anything of the nature of which one is ignorant. It strikes me, therefore, as a precaution that we should in some way answer the inquiries, "What is God, and how and where is He to be found ?" In endeavouring to supply this definition, I would first say that if there be one thing above another—one great peculiarity or attribute—one grand distinctive mark which expresses God, it is Life. We find Him revealing Himself to His creatures by the simple declaration, "I am." He is the self-existent one, who not only possesses life in Himself, but has the power of imparting that life to others. But, when I say "God is life," it is but offering an abstract idea which the natural man cannot grasp. We often find, however, that what is at first unintelligible to finite comprehension is made clear by attendant circumstances. Thus things visible to the naked eye are so simply by virtue of light. For instance, put out the light in this room, and I should be ignorant of your existence so far as sight is concerned. We therefore arrive at another principle, that light is essential to reveal the nature of existing things. Now, God dwells in light, but "He dwelleth in light whereunto no man can approach." Then how can we get a knowledge of Him who is life, though dwelling in that light by which He is revealed, since man cannot get to that light ? But God is a God of mercy, and, seeing that His creatures were separated from Him by sin, and living in darkness, He who is the light of the world—the light of life—came down from the bosom of the Father to shine in this dark world. Now, as the Father has life in Himself, so has He given to the Son to have life in Himself ; and this was the credential of His Godhead. Thus "in Him was life, and the life was the light of men ;" and though the darkness comprehended it not, "as many as received Him, to them gave He power to become the sons of God ;" saying, "I am the light of the world ; he that followeth Me shall not walk in darkness, but have the

light of life." Thus "He hath abolished death, and hath brought life and immortality to light through the gospel." We therefore gain another step in the attainment of the definite answer to the question, "What is life?" for God is not only life, but God is light also. But how can we apprehend light, since, like life, it is also an abstract thing, and known commonly only as antithetical to darkness? No, to comprehend it, we must know it in the concrete—in a form which is intelligible to us. Thus we find the true light became a man like ourselves; and so God, who is life and light, manifests in man what life is. I see life not only in God in the abstract, but also in the Son of God,—in a being like unto myself. I can take Him, so to speak, by the hand, and follow Him through His life on earth; and I can understand what that life is in operation; and life in operation, revealed by the true light, is love. I discern, then, that God is Life, and Light, and Love; and so I have the three great attributes of God presented to me at last in a form which I can understand, and also make intelligible to others. Thus light makes manifest to me the life, and the life becomes intelligible to me through love. Now, these peculiar attributes or properties of God must, to a certain extent, impress themselves upon what passes through His hands in creation, since we know from revelation that "by Him, and through Him, and to Him are all things." Through Him, therefore, it is that all created things pass, taking, to a certain extent, an impress from His form and peculiarities. Therefore when God says, "Let us make man in our image," I expect to find in that creature some sign or peculiarity derived from the Creator. But do I now see in the thing formed that life or being, light or intelligence, and love or charity, which characterises Him who formed it? When turned out of hand, God certainly pronounced His creature "very good," or perfect; but man was unable to sustain that perfection, as he had not life in himself, but merely the breath of life, constituting him a living creature; otherwise the Almighty would have created gods instead of men. The creature, however, had to learn his insufficiency and instability when left to himself. So this good God submitted him to the simplest possible test. With the most profuse liberality of the gifts of nature at his disposal, he was to be subject to but one law—viz, that he should not eat an apple; but as soon as the trial came he yielded to temptation and fell. Now, what was that fall but from a state of perfection or holiness to one of imperfection and failure? So the imperfect became disunited from the Perfect, and man was consequently separated from God. But do I not see still in that fallen creature, the natural man, even though thus remote from his Creator, some resemblance to God adhering to him? Yes, I recognize some life, light, and love in him, but it is only in a fragmentary form. By aid of revelation, I know our natural life is but death, our light darkness; and our love is imperfect or insane, often degenerating into hatred. But it may be urged that we are, nevertheless, still living. Yes, but wait for the threescore years and ten, and then what are we?—"even as a shadow;" "as the grass of the field, so we perish." And what is life, if it be not like that from which it originates—persistent, eternal? I lately listened to a very interesting lecture at the

Royal Institution, by Sir Samuel Baker, giving an account of his discoveries of the sources of the Nile. Now, suppose that by some giant force that river was severed from its Nyanza source, and that a telegram was sent down to Egypt stating that the Nile was no more—was dead. The Egyptian would rush to ascertain if it were so, and he would, of course, disbelieve the report, for he would see those mighty waters flowing on, giving beauty, fertility, and prosperity to his country; the ships would be still sailing on its bosom, and the crocodile basking on its sunny banks; in short, all would appear as usual, till its empty bed should declare that its existence had ceased,—that it was no more. And so it is with us in our unregenerate state. We have the principle of life, but it is cut off from its eternal source; and it is only by regeneration that we can be reunited to that source again, and be at one with Him “whom to know is life eternal.” (Cheers.)

Rev. S. WAINWRIGHT.—I agree very much with what has fallen from the last speaker; and I should not have risen were it not that I decidedly disagree with one thing he said. I understood him to say he did not think man, as originally formed, was perfect; and that if we were prepared to allow that the Almighty made man perfect, we must admit that he had created not men, but gods. But we are told expressly on the authority of the Bible that the first human being was absolutely created in God's own image, and that it was man's own fault that the race did not afterwards retain that image. We have a sort of general dictum laid down in Genesis as to all the works of God. After every act of creation it is said that “God saw that it was good:” and His work could not have been so described unless it were without flaw. I think it is important in these days that we should, in discussing these subjects, endeavour to show how irrefragable are our arguments drawn from other sources than scriptural authority and inspiration, though at the same time we affect no such independence of these as is maintained by some men, and are not above referring to that book which we believe to be an inspired record. Dr. Smith has asked, What is life? We might, indeed, ask, What is anything? What do we know of anything but by its effects? Now, just think of that for a moment. Take a handful of coarse blasting-powder. A rustic might say it was merely a handful of onion seed; and how are you to know the difference? But scatter it upon the fire, and then you will be able to tell what it is in a moment. Professor Huxley has told us that historically we know nothing of the origin of life. Now, I am ready to affirm that Professor Huxley is fundamentally wrong, and to maintain that historically we do know something of the origin of life. The Immutable and Eternal is unseen and unknown: He is surrounded by clouds and darkness; but it is the darkness which proceeds from excess of light. That light is so dazzling and blinding that, as Bishop Hall well says, those who gaze long at the sun will have specks in their eyes. Men neglect to search out what may be known of the invisible nature and character of God, so far as it may be furnished by the things that are seen. The heavens declare His glory; the vast firmament, the mighty ocean, and even every tiny flower and blade of grass, all declare His wisdom, His goodness, and His power.

And as I gaze upon the works of His hand, I am furnished with evidence that, though He has not made Himself visible, He has scattered around us proofs of what He is and does, and thus gives us impressions of Him which He wishes us to seize and to retain. Then He shows us in another way that which He cannot show us in that way. What are those moral principles by which all His mighty energies are guided and controlled? I take it to be one of the grandest things in the revelation of the Bible that it represents Him as bringing the human mind into contact with the divine energies in such a way as that he who has seen the Son has seen the Father; and we know on authority that in the working of that life we see the hidden life.

Mr. REDDIE—Greatly as I have sympathized with some of the remarks of Dr. Protheroe Smith and Mr. Wainwright, I cannot help saying that I think both those gentlemen have been led away from the precise subject before us; and I feel it is of the greatest importance that we should observe some sort of precision in our discussions. I am sure that great interest was felt in the remarks made by both those gentlemen; and it was only on that account that I did not rise to order very early after Dr. Protheroe Smith began to speak. Mr. Wheatley in his paper has not been discussing that highest life of all—the spiritual life—which proceeds especially and as it were afresh from the Creator to the soul of man, but ordinary and common life as once communicated to all the organic creatures of God's creation. The discussion, therefore, is not one which can be based upon metaphysical considerations, or a spiritual philosophy, but upon natural physical science. But with regard to one remark which fell from Dr. Smith: he said that a person who might enter this room could only be conscious of the presence of the rest through seeing us, and that he would only be conscious of the *natures* of existent things through the same means. Now, I venture to differ emphatically from Dr. Smith as to this. I venture to say that if a blind man had been present and heard the papers read to-night, and the remarks which have since been made, he would have been much more conscious of the presence of intelligent beings around him, from his hearing and intelligence, than others could possibly be from eyesight alone. Hearing would thus afford a better proof of the existence of intelligent man than seeing, and so the argument from sight falls to the ground. With regard to the paper itself, I will point out what appears to be a misapprehension on the part of the author, where he introduces a quotation from Dr. Odling. Mr. Wheatley observes, "Speaking of vital force, Dr. Odling says, 'So far as I can make out, it seems to be a sort of internal, intransferable, immeasurable, self-originating power.'—I believe it to be internal, not intransferable; immeasurable, not self-originating." I have not had the advantage of reading Dr. Odling's book, but, judging merely from that short quotation, I should be inclined to think that Dr. Odling means not that life is self-originated, but self-originating, in the sense that life is a power that develops and so originates growth, for instance, which is a power that you do not find existing in the inorganic world. The most nearly analogous thing to this in the inorganic world would, perhaps, be found in the case of certain crystals with regard to

which I dare say you, sir, will favour us with some observations bye and bye. In the organic world, however, there is this remarkable fact, that even in the smallest seed there is an enormous power of vitality and of growth, from which the building up of the solid wood of the strongest trees may result. It is a pity to force the language of any writer beyond the point to which he himself meant to go. Dr. Odling is talking of physical science,—his book is on chemistry,—and I do not see that in the words quoted he at all denies, or intends to deny, the divine origin of life. If, however, he or any other philosophers do venture, as some of them have no doubt done, to argue seriously that the inorganic processes of nature have a sort of life-originating power attached to them, then I say that this is very much like attempting to prove that two and two might make five. If they first deny that there was any life at all on the earth at one time, and assert that life was afterwards produced by some fortuitous combination of material atoms, or some extraordinary power in the elements themselves, then I cannot conceive anything more opposed to all their own principles as to force and matter than this. They tell us that force and matter are both indestructible, that neither could have had a beginning, and that they are both eternal; and yet their whole notion of producing life out of organic combinations is that something in time should begin to be. Now, that is just what we hold who believe in creation—namely, that there was once “a beginning to be;” but then we hold also that this proceeded from the Great Invisible First Cause, the existence of which is clearly manifested to us by the visible things around us, whether to the eye or through any of the other senses of man. Another argument may also be used if our opponents will admit that life is a thing at all,—if they do not deny an actual existence to that most potent power in nature. You are aware that the dogma of the immortality of the soul has been a question of continual discussion and debate; but I do not think that any of the religious philosophers—if I may use such a term—who have been anxious to prove the immortality of the soul have ever ventured upon such a strange argument as that which these mechanical philosophers have ventured upon with reference to the existence of force. For if force be indestructible—I do not grant it, mind—but if you grant that, and grant that life is a reality, and something analogous to force, then why should not life be also considered indestructible? Those philosophers who maintain the eternity of matter and force cannot consistently, when they come to that force which of all others is the most powerful in the world, argue that it may have come into existence by accident, and vanishes into nothing the moment dissolution takes place in an organic structure. And yet they really profess to believe that that most potent thing called life,—by the power of which, indeed, I now speak to you, and you are enabled to hear and understand,—they argue that that, the most potent force in nature, is destructible, and after a time vanishes into non-existence. (Hear, hear.)

Mr. WADDY.—I have been very much delighted with the first paper which has been read to-night. It is not, indeed, an exhaustive paper, but it is very suggestive. There is one part which appears to me a little weak in its

language, and I rather fancy that some mistake has been made by the author. Mr. Wheatley says, "To my mind, the experiments of M. Pasteur most conclusively negatived those of Mr. Crosse and Mr. Weeks, who found a species of *acarus* appear in solutions of nitrate of copper, silicate of potash, and ferro-cyanate of potassium—on which a powerful battery was brought to bear. A pretence of creative power was thereupon sought to be established. May there not be an attempt to prove rather too much here? Three distinct solutions, acted upon by electricity, each disengaged the same form of life. If the forces employed, the solutions used, and the surrounding conditions are all precisely the same, to the greatest possible exactitude, it is quite comprehensible how the same creature should appear, supposing that any could. But it is surely incredible that by the employment of various media the same animal appeared, unless on the supposition of the introduction of germs from outside." So far as my memory serves me, it never was suggested, either by Mr. Crosse or Mr. Weeks, that the *acarus* formed in one case was the same as that formed in the other. That it was a similar kind of animal life is true, but it never was said that it was exactly the same. The argument appears to me to be useless, unless we can insert another word or two, and read it that Mr. Weeks found the same species of *acarus* in solutions of nitrate of copper which he found in the other solutions, which I do not think was the case. And now with regard to the main argument of the paper, so far as the Darwinian theory is concerned, and the line of thought laid down here, it follows that if there be a series, or if Mr. Darwin supposed that there was a series, by means of which man has been produced from the lowest forms of animal life, then the series which has produced him is not simply a "sport," as it is called, but a regular link in what I might almost call a system of scientific gradation that may be in existence still on the earth; and wherever there are links wanting we might hope to be able to trace the whole series complete. But I never met any one who was prepared to say that the series could be traced, distinct and complete, in any manner. You may get one or two very remarkable similarities here and there, by means of which you leap a very long way in the dark. Beyond that, if the argument just hinted at is good, which I think there can be no doubt about, then we have a right to suppose that the "sport" should perfect itself in such a form as that we should find a whole series perfectly complete from the lowest form up to man. If we follow out the same thought in a divergent direction, we should find also an immense number of series rising from the lowest form up to the highest, but in very different positions. We do not find all molluscs the same, for instance. If I find my parentage in an oyster, it follows that I do not claim my origin from an anemone. If I come through the oyster, I should like to see some fresh series derived through the anemone, and that series completely carried on from the beginning, so that I may have the whole chain with all its divergences rising from the lowest up to the highest form, in all the dignity, beauty, and perfection of life. I think Mr. Wheatley has been a little troubled with this, which it was almost impossible for him to escape from,—I mean the two different lives of plants

and animals. It is impossible for us to connect consistently in the same argument the life of the plant and the life of the animal. The life of the animal is such a different thing in its nature and its results from the life of the plant, that I think there has been some confusion in different parts of the paper, arising from Mr. Wheatley's desire to keep his argument abreast of both those kinds of life. It is impossible to consider the origin of life without considering the end of life. To us, with our belief, death may be taken to be a negation of life—the abstraction of life. When that life which has been given us is taken from us, death ensues. But if I can work out properly the argument which must be worked out, it must follow that death is not a negation of life, but something actually positive, and not by any means a negation. Then what becomes of life in the end? These philosophers say that life is pressed into the body—that it arises in some fashion which we cannot explain. Supposing that this is accepted as satisfactory, I would still ask, What becomes of life when death arrives? Because, though we are told that the physical body is resolved into its elements, and that no atom of it is lost,—that you can trace it all in different forms,—still nobody has undertaken to trace what becomes of the life. It is gone : you cannot trace it, or find it in any shape. If it was born by chance, yet, having once been made, why is it to end any more than the body? Why is life to pass out of existence if the body is not? No philosophical answer has been given to this question. Though very much tempted, I will not, of course, go into the question of what becomes of the soul, because that is another matter altogether. Take an animal or a man dead. I can understand about the body. I know what will become of it. I can understand how it will be separated into its elements, but I cannot understand what will become of the life. I cannot see that it will turn into nitrogen or oxygen, or find what gases it is composed of. That is a question which might have been very aptly argued, and I think Mr. Wheatley would have done well if he had dealt with it in his paper. (Hear, hear.)

Mr. WARINGTON.—Before touching on the question which is before us, I will refer for a moment to that point as to what becomes of life, with regard to which I think I shall be able to explain the difficulty which has arisen. If life in vegetables or animals has originated from the modification of natural forces, it ends by a resolution into that out of which it originated. It goes back to that out of which it sprung. If you allow a quantity of light to fall on a dark surface, all the light which is absorbed is held to have resolved itself into another form of force, that which we call heat. So life passing away would resolve itself into some one or other form of force. I do not say that that is my view; I do not believe this myself; but I think that that would be the explanation given by those who hold the views which have been alluded to as to the origin and destruction of life. I only want to show that the difficulty in this question is not so very great. It would simply be considered as life passing back to that out of which it sprung. As to the paper itself, allow me first to notice what appears to me to be a misapprehension on the part of the

author as to the nature of organic matter. He endeavours to show that there is something intrinsically different in organic matter, as matter, which necessitates the supposition of a different origin. He says in one place, "There are peculiarities of composition in organic substance and structure, marking it off from the rest of creation by a deep and a wide valley, across which no human arm can throw a bridge. There are many elementary substances found in organic matter, the whole of which are not, however, present in all organisms. The four principal do pervade all that is organic, hence commonly called organic elements;—they are oxygen, hydrogen, nitrogen, and carbon. The presence of those in the organic is universal. They are also of the inorganic: and thus far, being common to both, why may not the one produce the other?—the lifeless, elaborate life? The peculiarities of their distribution forbid it. The elements generally form a binary combination in minerals; but in the organic world, at least three—usually four—of the elementary principles enter into combination to form the proximate principle—to educe each simplest substance."—I would deny *in toto* that mineral substances are generally, or scarcely even at all, binary compounds. Binary compounds, on the contrary, are rare. There are many cases of three, and plenty of four: so far like organic compounds. The difference Mr. Wheatley had in his mind was, no doubt, this, that in the mineral world you can trace the way in which the more complex compound has been built up, and show that it is binary in its complex form. But the whole tendency of chemistry shows us that this is true of the organic world. You can group your elements into radicals and connect them with other radicals. Take the whole theory of types in chemistry. Chemistry tells us of the water type, the muriatic acid type, and the ammonia type—all inorganic types,—and the tendency is to reduce organisms to these three inorganic types. Chemists are able now, by means of such simple natural processes by which they build up inorganic substances, to build up organic substances. They can, at any rate, build up the same compounds which are originated by means of life, but that does not mean that they can form life. It does not follow that in plants or animals they are formed in the same manner. The long roundabout method adopted by the chemists is very different from the "short cut" action of life. Chemists can make organic matter; but when they have got that they have not got organic life. It is only to point out what is irrelevant that I have gone into this criticism about organic matter. When you come to the life itself—the power which directs the natural forces of the plant or animal—no physical science will explain that. But let us be careful to see where the essential point lies, in order that we may not expose ourselves to a retort, for having misstated our argument. We find that a plant not only requires a certain amount of material to form its structure, but a certain amount of force to employ in its work. A seed put into the ground will not germinate unless it obtains sufficient heat to be used up by the plant in doing its work. You can connect the amount of work done with the amount of force employed in doing it. A later stage of its existence requires a certain amount of light, the employment of which is seen

in its results. So with animals. They require not only materials, but force stored up in their food with the materials, and they have to employ that in order to work out their ends. But, besides that, in the growth both of plants and animals, there is the vital power, the office of that vital power being to direct and control the physical power that it uses, and if it were not for that directing force the physical power would be ineffectual. We may take for example the cells of a plant, perfect in structure and chemical constituents. We may expose them to sunshine, give them carbonic acid and water, but still we fail to produce the slightest change in them. Yet we know that sunshine produces a change in the living plant, but then there must be some faculty in the plant itself to enable it to use that sunshine. That is the vital power. The directive power which uses all these things, and brings out the results, is the vital force. That vital force is in its character essentially different from any physical force that we have any knowledge of. Physical force, so far as we know it, is measurable—that is to say, a certain amount of force is required to do a certain amount of work, and if you want more done you must get more force. Vital force, on the other hand, is immeasurable, so far as we can see. It is immeasurable, not simply in the sense that we cannot set limits to it, but it does not appear to work by measure at all. We take a single seed, and we have vital power enough in that to produce millions and millions of fresh plants. No vitality comes to that seed from matter or physical force, yet it has power to spread life to an illimitable extent. We know of no physical power that can do that; and so no physical researches can help us to understand the rule of life. If we examine matter ever so closely, we never get nearer the origin of life. We may know more of its nature, but nothing of its origin. Physical science never has been and never will be able to tell us anything about it. The knowledge must come from somewhere else. I should like now to make one or two remarks on the latter part of the paper, concerning the development of life. How life has developed itself is a question entirely different from its nature and origin. Mr. Wheatley has used an argument with regard to new creations which I confess I am utterly unable to see the force of. He says, if we can show that some few creations have existed from the very beginning up to the present time unchanged, all necessity for a new creation is therefore done away with. How does it follow, because a certain number of species have been able to subsist through an infinite variety of circumstances unchanged, that all others should have done so too? I should think the argument would be rather the other way. The fact that only a few of existing species can be traced to the beginning is to my mind a proof that there have been fresh creations. How does he account for the extinction of certain animals? Because, he says, circumstances have altered. But on the same evidence we are bound to believe that others have come in. We find that animals which existed previously do not exist now, and we find that animals and plants exist now which did not exist ages ago. The argument cuts both ways, and we must believe that at certain periods fresh animals and plants have come into existence, but whether by fresh creation or not is another question. We are

bound to believe that new ones have made their appearance in this world in some way or other since the first beginning of creation, and that some old ones have passed away. No one who knew geology practically would deny that.

Mr. REDDIE.—Professor Huxley attributes these apparently new creations to migration.

Mr. WARINGTON.—And now may I notice another point of Mr. Wheatley's paper with reference to tropical plants and animals to be found in old strata, and which required a tropical climate and a vertical sun? Mr. Wheatley says,—

"They are the forms of a tropical land. How then came they into these climates? for sure it is they neither do nor could flourish here now. What is there wanting wherewith we cannot supply them? There must be something. So there is,—a vertical sun. According to the distribution of the sun's glorious rays, so is vegetation, so is animal.

"It has been customary to account for climatal changes chiefly by atmospheric alterations, brought about by the great currents of the ocean taking a new course, by sea usurping the place of land, or land that of sea. But with our northern sun, alterations could never account for the lion and tiger in our forests, nor the palms and tree-ferns of the tropics on our uncongenial soil. Hitherto, every change of surface on the globe has been attributed to upheavals and subsidences—an upward and downward movement in the same spot—even to the reversing large tracts of country. And the geological mind has been satisfied with it—has given its best attention to it—has become saturated with it—has assumed hypotheses, and drawn inferences, very much to its own satisfaction;—children of imagination, bright and delusive.

"We can understand the sudden coming on of an icy period. Let the gulf stream be deflected from our shores, and a raising of the land take place—a climate might be produced wherein life must give way under its intensely glacial aspect. Ice and snow which no summer's sun could melt—or whose rigour could be even mitigated—would reign undisputed. But so long as our latitude is unchanged, how can we have the heat of Bengal, the burning plains, the steaming jungles? How enjoy the pleasures and pay the penalties of those districts where lurk beast and reptile of surpassing beauty, and where vegetation rises in all its grandeur? Where else is this to be found? Where else? here, under our very feet are buried races of the tropics. We see it in multitudes of shells; we see it in vast numbers of animals; we see it in trees, having at this hour their roots in the very soil in which they grew luxuriantly under warmer skies, showing the impossibility of their having arrived where we find them by any accidental occurrence—any convulsion of nature. Long is it since the beams of a sun which did this have ceased to visit our land."

The whole argument proceeds on the assumption that those tropical plants are the same as those which now flourish in tropical lands. I believe that is not so—

Captain FISHBOURNE.—Surely that is not Mr. Wheatley's argument.

The CHAIRMAN.—I think it is scarcely Mr. Wheatley's view. What I understand him to mean is that those plants could not have flourished except under a vertical sun.

Mr. WARINGTON.—It struck me that he meant they were the same tropical plants. His language is ambiguous, and I suppose I have been mistaken—

The CHAIRMAN.—He goes on then to refer to Mr. Evan Hopkins's idea of the change of surface.

Mr. WARINGTON.—I wish now to notice a misrepresentation of the Darwinian theory towards the close of the paper. I will not discuss the merits of that theory, but simply point out what seems to me to be a great misunderstanding. He says, "A variety thrown off by the parent plant is a species at once, or not at all. It is only a temporary variety; for, when it has grown up and become a perfect plant, it must either die out, revert, or perpetuate *itself*." His argument goes upon this assumption, that if it perpetuates itself it is a species, but if it reverts or dies out it ceases to be a variety. There is no possibility of an intermediate stage. Now, take the simple case of man; a negro perpetuates himself, and a Chinese, and a North American Indian, with all their differences, most exactly; yet we firmly believe that they have all sprung from one original stock——

The CHAIRMAN.—He gives the definition of that. He calls that hybrid, and says that the hybrid cannot be perpetuated. Hybrids, therefore, would not be species, according to him.

Mr. WARINGTON.—I am endeavouring to show that according to his argument they are species, because they are reproducing and perpetuating themselves, with all their characteristic differences, and, therefore, according to his theory they are species; yet, having been formed from varieties——

The CHAIRMAN.—Not according to his definition of species, I think.

Mr. WARINGTON.—There is another serious misunderstanding on the same page. Mr. Wheatley says, "Where man interferes, in the way of improving a species or a variety—such as our culinary vegetables and our florists' flowers—he is obliged to continue by industry what he acquired by skill; else would the size and succulence of his parsnips and his celery, and the glory of his roses and carnations, very soon return to what we consider the insignificance of their originals—neither pleasing his palate nor delighting his eye." Here he is speaking of arbitrary conditions, where the result depends on those conditions being maintained. Mr. Darwin will tell you the same law holds good in nature; if the conditions be maintained, then the variation will remain. It is the same with arbitrary alterations as with natural alterations. I cannot pretend to go into any discussion on this matter; I simply wish to point out an instance in which Mr. Darwin's theory has been unjustly dealt with by Mr. Wheatley. I would especially urge upon every one who deals with the subject to be perfectly clear with regard to this point, that if we could show that life developed itself after the manner of Mr. Darwin's theory, we should have got no nearer to the essential point of life's origin. It would not be much more wonderful if that life should be able to develop itself with variation than that life could develop itself at all. That is a marvel in itself, and if life does not always in developing assume the same form, we are not increasing the marvel, or doing anything to solve the question whence the vital power springs and what it is. (Hear, hear.)

The CHAIRMAN.—Mr. Wheatley has made a slight mistake with regard to crystals, which I should not have referred to had I not been invited to do so. He says, "Crystallography has been appealed to as evidence that

nature does evoke regularity of shapes from the shapeless, and that man can imitate nature with her own materials. It is quite true. Nature's only regular form is the crystal ; and though there are several primaries, and a multitude of secondaries, they are all solid bodies, having plane and smooth surfaces." That is not absolutely true. There are a few crystals with curved surfaces—the diamond has curvilinear faces. Why the diamond and one or two others should present that variation is not quite clear, but that is the fact. With regard to the quotation which Mr. Wheatley has given from Dr. Odling, I may say that Dr. Odling's argument has been entirely mistaken ; he actually denies the existence of vital force altogether. His language is exceedingly ambiguous ; but when you look at the list of the subjects of the various paragraphs of Lecture IV., you will find the words "baseless hypothesis of vital force," and in the text he says that there is no such thing in existence. His view is that you have no right to say that you have any different force acting on the body, in order to combine the materials, but those forces which act in nature upon inorganic bodies,—that because the chemist can imitate some of the results of dead matter, a thing until lately deemed to be impossible, because he can make acetic acid and other things without using any organic matter, you have no reason to believe in vital force. He says that "all the actions of the animal body are traceable to cosmical force ; that in living, as in dead matter, there is no creation of force ; and that any explanation of the phenomena of life which recognizes the agency of vital force is simply no explanation at all. Applying the word 'force,' as we now do, to certain transferable states of actual or potential activity having quantitative metamorphic correlations, I much question whether the expression 'chemical force' is a correct one, though it is one of which the meaning is perfectly definite and intelligible. By the chemical force of so much oxygen and hydrogen, for instance, we mean the potential energy stored up in them at the moment of their separation, and reproducible from them in the act of their combination. Similarly, we might apply the phrase 'vital force' to the potential energy of so much fat or muscle, capable by oxidation of being manifested in the form of external heat or motion. But what the physiologist means by vital force I have never been able to understand. So far as I can make it out, it seems to be a sort of internal, intransferable, immeasurable, self-originating power, which performs nutritive acts by its absolute will and pleasure, as if it were not abundantly manifest that the growth of a plant and incubation of an egg cannot be performed without a direct supply, and the development of animal organisms without an indirect supply of external force." Further on, speaking of the question of making organic matter by chemical processes, he says, "This question, decided absolutely in the negative, so long as the fiction of vital force tyrannized over men's minds, has of late years received a rapid succession of brilliant affirmative replies. Already hundreds of vegetable compounds, heretofore produced only in living organisms, and, as was supposed, put together and held together by vital force, have been formed by the chemist in his laboratory out of carbonic acid, water, and ammonia ; or, in other words, out of charcoal, hydrogen,

oxygen, and nitrogen." You find there that Dr. Odling denies the existence of vital force altogether. I think we are much indebted to Mr. Warington for pointing out so clearly the difference between vital force and physical power. Suppose a chemist can build up so much flesh, or artificially make so much wood or so much quinine, does he get any nearer to an organic body, or to organic life? There is no structure in these things. If he builds up the flesh he does not produce a living body—a something endowed with something else, call it vital force, or power, or anything else, which renders it capable of perpetuating itself. It is marvellous that this something should be capable of taking all the powers of inorganic nature—sunlight and heat and all the other elements—and building them up so as to perpetuate other creatures through all time. You have nothing approaching that—nothing at all like that force anywhere else. No one could have stated that more clearly than Mr. Warington, and it is essentially one of the points in dispute. I was in hope that somebody would have told us more about physiology. Years ago I attended a course of lectures, delivered at the College of Surgeons by Mr. Paget, on the "Life of the Blood." Hunter was not ashamed when he wrote on inflammation to go to one Book, and he took the passage that "the life was in the blood" as the motto for his work, and I do not believe he got beyond it. Mr. Paget stated most lucidly in his lectures that it was impossible to give any scientific definition of life which would hold water—such a definition, for instance, by which we would be enabled to show it differs from everything inorganic. I was somewhat interested in those lectures, and it was through them that I was led to devote my spare time to the investigation of the science of crystallography. Mr. Paget said that the nearest approach you could get to a definition of life was that of a German, whose name I forget, that a living body was that which, when injured, was capable of repairing the injury. But, he continued, according to that, a crystal of alum was a living body, and he exhibited the model of an alum crystal as it was when it had been broken, and another model showing how it had repaired the injury when put again into the solution where it was originally formed. The first model represented the broken crystal, the second showed a perfect octohedron. The crystal, therefore, according to that definition, was a living body. I wanted to know how it was that the crystal could thus repair an injury of itself. He said that the discovery had lately been made by a German, but I afterwards found it was in Mrs. Somerville's *Introduction to the Physical Sciences*, and that it was not a new discovery at all, but an old one revived. Although we cannot define life, there is the widest difference between a living creature of any kind and a dead carcass. In the body without life there is no perpetuation of growth, as there is in the living animal of the lowest or most imperfect type. It was held at first to be a mistake on the part of Liebig and others, who supposed it was possible for the chemist to make the combinations found in living bodies by means of inorganic elements, but it is true. Still it does not bring you one step nearer to making the living body. It was well known before, that phosphate of lime could be procured from bones.

just as acetic acid or alcohol could be obtained from bodies, which had had life, after death. You can get phosphate of lime from bones, and carbonate of lime from shells, but life is beyond all chemical force, and beyond all electrical force, marvellous as that is. How are all the complex organs, with which we are so well acquainted, formed out of the living blood? How do the blood corpuscles perform such subtle chemistry? To say that the chemist can make these organic compounds without life is no nearer the matter than to tell me that because the telescope is made of brass and glass, that, therefore, the structure of the telescope or the microscope is only the result of the action of brass and glass upon one another. I should resent such a thing as an absurdity. But what is that wonderful, subtle thing—call it force, or vitality, or what you will—which is resident in me, and which is possessed of such marvellous powers? How does Dr. Odling, or any other chemist, produce his organic compounds? He first takes organic bodies and pulls them to pieces in order to find out their constituents, and then, in a roundabout way, he gets similar elements combined in a certain form. But my blood corpuscles are constantly doing that for me in the most perfect manner, and in every part of my body. They do not put a crystalline lens in my hand, but in my organs of vision the most perfect lenses are placed in the position and with the surroundings best fitted for their immediate and constant use. Wonderful as it is that my blood corpuscles, having a life of their own, should be able to form such a wonderful and marvellous organ as the eye, it is not more wonderful than the operation of my heart, or than the construction of my veins, with all their beautiful valves placed just where those valves ought to be to prevent the regurgitation of the blood. Where did that marvellous power come from which could make such an organ as the eye, which is mathematically perfect—its perfection being such that no man can imitate it? How are these blood corpuscles endowed with wisdom for doing that? It must have come from some other and higher source, and the very character of the work perfectly manifests the source whence it came. That wisdom could only have come from the Source of all wisdom, and all these results, instead of coming by chance, or being self-originating, are based upon knowledge as sure, as certain, and as mathematically accurate as anything. When I tell you that this is oxygen and this hydrogen, and that both combined will give me water,—if I can say that, as the result of accurate and scientific study, I am forced, by the observation of the organs of my own body, formed there unknown to me, and by the vital action going on in that body,—I am forced to acknowledge, as a scientific fact and truth, that all these things could only have come from the Source of all wisdom, the Almighty Creator of all things. (Cheers.)

Dr. PROTHEROE SMITH.—I wish to correct a misapprehension on the part of Mr. Wainwright as to what I said. I agreed that man was created perfect, but I argued that he was incapable of sustaining that perfection, and therefore fell.

The meeting was then adjourned.

REPLY BY MR. WHEATLEY.

I beg to be allowed the gratification of returning thanks for the kindness with which my paper was received; and I will be as brief as possible in answering such objections as were raised to some of the arguments contained in it.

I can only reply to Mr. Reddie by saying that he is right in not considering Dr. Odling "denies, or intends to deny, the divine origin of life," in the words quoted. I gave them solely to remark that whatever argument he might build upon them would be unreliable, as it seemed to me the definition he gave of vital force was not correct; by which I meant, it was not in accordance with my own ideas as a believer in it; and I think (from what he says he can make out of the physiologists' meaning as to vital force) that he misrepresents the notions any believer has of it.

Mr. Waddy does not think that identically the same acarus was produced by the experiments of Mr. Crosse and Mr. Weeks from different solutions. My authority for the assertion is not either of those gentlemen, but the author of the *Vestiges of Creation*, who says, "The insects produced by both experimentalists seem to have been the same—a species of acarus, minute and semi-transparent, and furnished with long bristles, which can only be seen by the aid of the microscope." A species—each individual described alike. If this be true, the deduction from my argument is true also: and true I presumed it to be from the circumstantial specification of the animals.

Mr. Warington considers I am in error on several occasions. He observes, "Mr. Wheatley has used an argument with regard to new creations which I confess I am utterly unable to see the force of. He says that if we can show some few creations have existed from the very beginning up to the present time unchanged, all necessity for a new creation is therefore done away with." Surely if any genera are proved to exist from the beginning, so far as geology has reached, there can be no necessity for new creations; because, since any *were*, all *could* have been originally created together. What could have been may have been, and subsequent *necessity* ends. Mr. Warington continues: "How does he account for the extinction of certain animals? Because, he says, circumstances have altered. But on the same evidence we are bound to believe that others have come in." It appears to me a very decided *non sequitur* that, because altered circumstances have destroyed one form, another and different form should be built up. I do not see the sequence. "We are bound to believe," again says Mr. Warington, "that new ones have made their appearance in the world in some way or other since the first beginning of creation, and that some old ones have passed away. No one who knew geology practically would deny that." I do know some little of geology,

practically, yet cannot help denying it, and for the following reasons :—The proof is rested on geological evidence. What is that evidence? We are presented with forms of living things which were and are not. Their extinction may not be doubted. But where is the geological proof of successive introductions of other forms of life? Is it because of that class of facts which says the Pleuronectidæ are not found in the earliest strata where fish is discovered, and must therefore have been a subsequent introduction? In dealing, most especially, with geological evidence, three things should be carefully borne in mind—that absence is no proof of non-existence; that presence is no proof of recent introduction; and that so comparatively small an area has been subjected to geological research, inferences should be received with the greatest caution. In seeking after epochs of introduction, the evidence of the rocks is purely negative, and negative witness is no witness at all. A few years since, palæontologists found no bird in any older deposit than the tertiary, affording the loose geological negative evidence of the introduction of birds during that period. The *Archæopteryx macrurus* was afterwards detected in the upper oolite, and part of the skeleton of another gull had been found in the greensand of the cretaceous series. From these and similar facts, I cannot agree with Mr. Warrington that the practical geologist must necessarily believe in fresh introductions of life since the first beginning of creation. To fix the date of an event in the tertiary rocks, from negative testimony, and then find it *must* have occurred in the secondary, if not earlier, shows the value of such geological inference; and only those carried away by the fascinations of science can subject their reason to their imagination.

Mr. Warrington takes up another part of the subject. He says, "I wish now to notice a misrepresentation of the Darwinian theory"; and he proceeds to observe that my argument goes upon the assumption that, if a variety thrown off by the parent plant perpetuate itself, it is a species; but if it revert or die out, it ceases to be a variety. And he brings this example in refutation: "Now, take the simple case of man. A Negro perpetuates himself, and a Chinese, and a North-American Indian, with all their differences, most exactly; yet we firmly believe they have all sprung from one original stock." If I had intended to have expressed the opinion that a variety could perpetuate itself *so as to set up another species*, how could I have said on the preceding page, "I consider that the perfect and complete forms were those created, from which *varieties cannot be raised into species*"? And again, the two lines immediately before Mr. Warrington's extract show the intended meaning of the whole passage:—"If varieties *could* be converted into species, extended time, such as Mr. Darwin requires, seems a most unnecessary step in the process." *If they could*, plainly tells my belief they could *not*. However, I am afraid the sentence on which he comments is ambiguous—no light fault in scientific discussion.

Alluding to the necessity of our culinary vegetables and florists' flowers being continued by constant care in the state to which artificial culture has brought them, Mr. Warrington says I have dealt unjustly with Mr. Darwin's

theory ; and adds : " Here he is speaking of arbitrary conditions, and the result depends on those conditions being maintained. Mr. Darwin will tell you the same law holds good in nature ; if the conditions be maintained, then the variation will remain. It is the same with arbitrary alterations as with natural alterations." No doubt. Yet how does this militate against my argument, that varieties cannot be converted into species ? It appears to me that no circumstances whatever can do this. Revert the conditions, whether natural or artificial, and the variety at once fails. But will the species ? I conceive not. Alter the conditions of existence which surround the Negro, and the *Negro* will die out—not the *man*. The perpetuation of the various races of man is no proof as to whether they are either varieties or species. An aggregation of varieties will form a species. Could every variety be extinguished, the species would be at an end. But the subject is too extensive for further discussion here.

I have to thank the Chairman for correcting an assert on I made on crystallography. I said all crystals had plane surfaces. Mr. Mitchell refutes it, and says, " There are a few crystals with curved surfaces : the diamond has curvilinear surfaces. Why the diamond and one or two others should present that variation is not quite clear ; but that is a fact." My knowledge of crystallography is extremely limited ; though directly after having said that all crystals had plane surfaces, I added, " pseudomorphous forms arise ; but the laws of crystallography are, for all practical purposes, irrefragable " ; showing that I was not altogether unaware of occasional deviations, though certainly unaware that the diamond was—more than this—a constant exception.

ORDINARY MEETING, FEBRUARY 17, 1868.

CAPT. E. G. FISHBOURNE, R.N., C.B., HON. TREASURER, IN THE
CHAIR.

The Minutes of the previous Meeting were read and confirmed ; and the names of the following new members and associate were announced, viz. :—

MEMBERS :—H. Cadman Jones, Esq., Barrister-at-law, late Fellow of Trin. Coll., Cambridge, 4, Old Square, Lincoln's-Inn Fields ; Rev. Archibald Macmillan, 6, Westbourne-Park Place ; Rev. Lewis Barrett White, M.A., the Rectory, 67, Queen Street.

ASSOCIATE, 1ST CLASS :—Miss Dudin Brown, Alexandra Hotel, Knightsbridge.

The Rev. WALTER MITCHELL then read the following paper, which he had previously read at Sion College, in reply to Professor Huxley's address, delivered there on the 21st of November last :—

*ON THE UNPHILOSOPHICAL CHARACTER OF SOME
OBJECTIONS TO THE DIVINE INSPIRATION OF
SCRIPTURE. By the Rev. WALTER MITCHELL, M.A.,
Vice-President.*

THE President of Sion College was pleased to invite a distinguished professor to give the clergy connected with that college an account of the supposed great divergence of thought between men of science and the clergy. We were told upon that occasion by Professor Huxley that the evidence afforded by the Nile mud and the facts disclosed by geology were such that no scientific man or duly instructed person could believe in the truth and divine inspiration of the works of Moses. I propose now, First, to sift the evidence by which the vast antiquity of man is sought to be proved, and to demonstrate its unscientific character and perfect worthlessness :—

Secondly, to show that the progress of geology has been retarded by the unphilosophical manner in which the precepts

of Bacon have been disregarded; that when that science is freed from the fetters of "feigned hypotheses," it tends to prove the accuracy and truthfulness of Moses:—

Lastly, that the great divergence between some professors of science and the clergy, produced in reality by the denial of creation, arises from no true progress of science. That it has been caused by the importation of the rationalistic principles of Strauss into the domain of physical science. That it rests on no philosophical basis, and is only the product of imaginary hypotheses unfounded on fact. The first question I propose to investigate is the scientific evidence adduced in support of a far higher antiquity for the human race than any that can be derived from Holy Writ.

According to Hales's chronology, man was created 7,279 years ago, and according to Ussher 5,872 years only have elapsed since that event. The discrepancy between these two distinguished chronologists may be taken as a proof how very difficult it must be to derive an accurate chronology from the data given in the Bible. It is asserted, however, that there is good scientific evidence to show that civilized man has existed in Egypt 30,000 years, and that man inhabited the banks of the Mississippi 50,000 years before the present time. Surely, we are told, it must be admitted that no stretching of the Bible chronology can be made to include such vast periods.

Sir Charles Lyell's *Antiquity of Man* is so extremely vague in its statements of the scientific methods by which this great antiquity is arrived at that we must have recourse to some more definite authority to investigate the scientific value of the methods by which this problem is determined. In the *Philosophical Transactions* for 1855 there is a paper by Mr. Leonard Horner, Vice-President of the Royal Society, and Vice-President of the Geological Society, in which he seeks to prove, by strictly scientific methods, that civilized man existed in Egypt 13,371 years before A.D. 1854. He states,—

"In accordance with the opinion I entertained when I undertook the inquiry that excavations should be made in the vicinity of some very ancient monument, the age of which is known, I chose the site of the long-extinct city of Memphis, now covered with the date-groves of the modern village of Metrahenny, twenty miles above the parallel of Heliopolis, and about thirty miles above the apex of the Delta. All testimony appears to concur as to its very remote antiquity, in assigning its foundation to Menes, the first king of the first dynasty which reigned over Egypt, and who, according to Lepsius, the latest and very able expounder of Egyptian chronology, began his reign 3,892 years before the Christian era."

But one solitary monument of the former greatness of Memphis remains. About forty years ago Signor Caviglia, observing some indications of buried sculpture between the modern villages of Metrahenny and Bedreshin, made an excavation about five feet deep, and uncovered the whole length of a colossal statue. On this statue there are hieroglyphics, by means of which Mr. Bonomi determined that it represented Rameses II., the Sesostris of the Greeks. Mr. Horner quotes Herodotus, as saying

"That Sesostris erected two statues, each 30 cubits high, before the temple of Vulcan in Memphis, representing himself and his queen, and four statues of his sons, each 20 cubits high."

The uncovered statue Mr. Horner believes to be the statue of Sesostris spoken of by Herodotus. He wrote to Dr. Lepsius to assign a date to it, and received this reply :—

"If we may assume that the Memphis statue represents Rameses while a young man, of which the absence of the beard would not be, of itself, a decided proof, we should then be justified in assigning it to the beginning of the 14th century before Christ. According to my estimate, Rameses Mianun reigned from about 1394 to 1328 B.C."

Having thus obtained a monument of assumed known age, Mr. Horner, through the influence of the Hon. Charles Murray, then Consul-General in Egypt, induced the Egyptian Government to cause a number of pits to be sunk, partly by excavation and partly by boring, in the immediate vicinity of the fallen statue. Mr. Horner was not present, but all the operations were carried out by Hekekyan Bey, an Armenian officer of engineers, who had received a scientific education in England.

The depth of mud accumulated above the base of the pedestal of the statue, assuming that mud to have commenced to accumulate from the time that the statue was erected, was taken as affording a just estimate of the secular rate of increase of the Nile mud at this spot.

"In the excavation at this statue in the area of Memphis in 1852, the level of the upper surface of the platform on which the statue had stood was ascertained to be 5 feet 8 inches below the surface of the ground; but as there were eight inches of a sandy earth, there remained five feet of true Nile sediment. The upper blocks of the platform are $31\frac{1}{2}$ inches thick, and the lower $35\frac{1}{2}$ inches; together 5 feet $6\frac{1}{2}$ inches. If we allow the lower part of the platform to have been $14\frac{1}{2}$ inches below the surface of the ground at the time it was laid, we have a depth of sediment from the present surface of

the ground to that level of 9 feet 4 inches. Rameses, according to Lepsius, reigned from 1394 to 1328 B.C., and if we suppose the statue to have been erected in the middle of his reign, i.e. in 1361, we have between A.D. 1854 and that time 3,215 years, during which the above depth of 9 feet 4 inches of sediment was accumulated; and, supposing that no disturbing cause had interfered with what may be termed the normal rate of deposition in this locality, and of which there is no evidence, we have thus a mean rate of increase within a small fraction of $3\frac{1}{2}$ inches in a century."

In this way Mr. Horner determined the first step in his problem, the mean rate of the deposition of Nile mud at the base of the statue. At a depth of 39 feet from the surface a fragment of burnt brick was obtained. This enables Mr. Horner, as he supposes, to determine a period at which civilized man inhabited the valley of the Nile.

"In a large majority of the excavations and borings," says Mr. Horner, "the sediment was found to contain, at various depths, and frequently at the lowest, small fragments of burnt brick and pottery. In the lowest part of the boring of the sediment at the colossal statue in the year 1854, at a depth of 39 feet from the surface of the ground, consisting throughout of true Nile sediment, the instrument brought up a fragment of pottery, now in my possession. It is about an inch square and a quarter of an inch in thickness, the two surfaces being of a brick-red colour, the interior dark grey. This fragment, having been found at a depth of 39 feet, if there be no fallacy in my reasoning, must be held to be a record of the existence of man 13,371 years before A.D. 1854, reckoning by the before-mentioned rate of increase in that locality of $3\frac{1}{2}$ inches in a century, 11,517 years before the Christian era, and 7,625 years before the beginning assigned by Lepsius to the reign of Menes, the founder of Memphis; of man, moreover, in a state of civilization, so far, at least, as to be able to fashion clay into vessels, and to know how to harden it by the action of a strong heat.

"In the pit marked No. 6 in the ground-plan, at page 62, which was 354 yards north of the colossal statue, at a distance of 330 yards from the river, fragments of pottery were found at a depth of 38 feet from the surface of the ground.

"Fragments of burnt brick and of pottery have been found at even greater depths in localities near the banks of the river, 10 and 16 miles below Cairo. In the boring of Sigul, described in page 64, under the number 26, fragments of burnt brick and pottery were found in the sediment brought up from between the 45th and 50th foot from the surface; and in the boring at Bessouase they were brought up from the lowest part, viz., 59 feet from the surface, but in this case in sand, the lowest sediment containing fragments of brick and pottery being at a depth of about 48 feet. I have also learned, from a communication with which I have been favoured by M. Linant de

Bellefonds (Linant Bey), that a few years ago he made a boring about 200 mètres (656 feet) from the river on the Libyan side of the Rosetta branch of the Nile, in the parallel of the apex of the Delta, and that he had found fragments of red brick at a depth of about 72 feet below the surface of the ground. But in these cases there was wanting the fixed point of known age, the indispensable requisite for the formation of a chronometric scale. I may, however, state that M. de Rozière estimates the mean rate of the deposit of the sediment in the Delta as not exceeding 2 French inches and 3 lines (60·907 millimètres = 2·3622 English inches) in a century."

I have given you, though at the risk of being thought tedious, the exact words in which Mr. Horner solves his problem for determining the age of man in Egypt. First, because of the importance still attached to this problem; secondly, because I can find no other attempt to solve the problem of man's age by means of mud-deposits approaching to anything like the scientific accuracy sought to be attained by him. We have plenty of dogmatic statements that Nile mud or Mississippi mud accumulates at such a mean rate per century, but no proof or even statement of the methods by which that rate is determined.

Such a multitude of assumptions are made by Mr. Horner in accumulating the data for the solution of his problem that the most superficial consideration of it must lead us to suspect some great fallacy in his reasoning. Is there any real proof of the date of the colossal statue? Some assert that Egyptologists cannot interpret hieroglyphics, and maliciously compare translations of the same hieroglyphical inscription, by two equally eminent translators, which do not agree in a single word, and are most opposite to each other in sense. But taking for granted that the inscription is rightly read as that of Rameses II., what proof is there that it was erected in his reign? When the future New Zealander speculates on the date of the statue of Richard I. now standing at Westminster, will he be right in assuming that it was erected in the middle of his reign?

If it be the statue spoken of by Herodotus, where is the colossal statue of the wife and the two colossal statues of the sons? Why have these disappeared without a trace, leaving only that of the king? Again, do not many distinguished Egyptologists differ from Lepsius in his chronology?

What says Sir G. Cornewall Lewis, in his *Astronomy of the Ancients* (p. 370), about the estimate of Lepsius, that Sesostris or Rameses Mianun reigned from about 1394 to 1328 B.C. ?—

"Lepsius agrees with Bunsen that Sesostris on the Manethonian list, who stands in the 12th dynasty at 3320 B.C., is not Sesostris, but, instead of ele-

vating him to the 3rd dynasty, brings him down to the 19th dynasty, and identifies him with Sethos, 1326 a.c., chiefly on account of a statement of Manetho, preserved by Josephus, that Sethos first subjugated Cyprus and Phœnicia, and afterwards Assyria and Media, with other countries farther to the East. . . . We therefore see that the two leading Egyptologists, Bunsen and Lepsius, differing in other respects, agree in thinking that Sesostri is not Sesostria. . . . But here their agreement stops. One assigns Sesostri to what is called the old, the other to what is called the new empire, separating his respective dates by an interval of 3,793 years. What should we think if a new school of writers on the history of France, entitling themselves Franco-logists, were to arise, in which one of the leading critics were to deny that Louis XIV. lived in the 17th century, and were to identify him with Hercules or Romulus, or Cyrus, or Alexander the Great, or Cæsar, or Charlemagne, while another leading critic of the same school, agreeing in the rejection of the received hypothesis as to his being the successor of Louis XIII., were to identify him with Napoleon I. and Louis Napoleon ?”

Baron Bunsen eagerly accepted Mr. Horner’s conclusions, which fitted his elastic chronology with sufficient accuracy, and formally adopted them in the third volume of his *Egypt’s Place*, &c. This gave the *Quarterly Review* for April, 1859, an opportunity of refuting Mr. Horner in the most crushing manner. The *Quarterly Review* pointed out that Mr. Horner did not see the fragments brought up from the borings ; that any one who had any experience of Egyptian workmen knew well that they would easily produce pieces of brick and pottery when once they discovered that such common things were all they were required to seek for. Assuming, however, that the fragments were really brought up from the depths of forty feet, there might still be great doubts as to their assumed antiquity.

“According to an ancient tradition” (Herod., ii. 99), says the reviewer, “Menes (that is one of the earliest kings of Egypt), when he founded Memphis, is related to have diverted the course of the Nile eastwards, by a dam about 100 stadia, about twelve miles south of the city, and must have dried up the old bed. If so, many years must have elapsed before the old bed became filled up by the annual deposits of the inundation, and a piece of pottery may have been dropped into it long after the time of this early king, for we do not know the course of the old bed, and the statue may stand upon it, or the piece of pottery may have fallen into one of the fissures into which the dry land is rent in summer, and which are so deep that many of them cannot be fathomed even by a palm-branch. Or at the spot where the statue stood there may have been formerly one of the innumerable wells or pits from which water was raised by means of earthen pots. Again, we know from the testimony of Makrisi that less than a thousand years ago

the Nile flowed close by the present western limits of Cairo, from which it is now separated by a plain extending to the width of more than a mile. In this plain one might now dig to the depth of twenty feet or more, and then find plenty of fragments of pottery and other remains less than 1,000 years old! Natural changes in the course of the Nile similar to that which we have here mentioned, and some of them doubtless much greater, have taken place in almost every part of its passage through Egypt.

"Thus far we have adapted our remarks to Mr. Horner's estimate of the mean rate of the increase of the alluvial soil. Most of this estimate is founded upon a grave mistake, that is, upon the assumption that the upper surface of the platform on which the colossal statue stood was scarcely higher than the general surface of the plain. The temple which contained the colossal statue was one of the buildings of Memphis, and, according to Mr. Horner's assumption, it is a necessary consequence that both the city and the temple must have been for many days in every year to the depth of some feet under the surface of the inundation. This is quite incredible, and we may therefore feel certain that the Nile deposit did not begin to accumulate at the base of the statue till Memphis had fallen into ruins, about the fifth century of our era.

"These considerations, and many others which we might urge, tend to show that Mr. Horner's pottery is no more likely than M. Bunsen's chronology to compel us to abandon our faith in the old Hebrew records. But one fact, mentioned by Mr. Horner himself, settles the question. He tells us that fragments of *'burnt brick and of pottery have been found at even greater depths (than thirty-nine feet) in localities near the banks of the river,'* and that in the boring at Sigiul *'fragments of burnt brick and pottery were found in the sediment brought up from between the fortieth and fiftieth foot from the surface.'* Now, if a coin of Trajan or Diocletian had been discovered in these spots, even Mr. Horner would have been obliged to admit that he had made a fatal mistake in his conclusions; but a piece of *burnt brick* found beneath the soil tells the same tale that a Roman coin would tell under the same circumstances. Mr. Horner and M. Bunsen have, we believe, never been in Egypt, and we therefore take the liberty to inform them that there is not a single known structure of burnt brick from one end of Egypt to the other earlier than the period of the Roman dominion. These fragments of burnt brick, therefore, have been deposited after the Christian era, and, instead of establishing the existence of man in Egypt more than 13,000 years, supply a convincing proof of the worthlessness of Mr. Horner's theory."

This criticism on Mr. Horner Sir Charles Lyell seeks to answer, in his *Antiquity of Man*, by stating that Hekekyan Bey was too sagacious to be deceived by his workmen; that, as most of the borings were made far from the sites of towns and villages, there was but small chance of the borings striking upon the sites of old wells; that there was an equal im-

probability of their striking upon wells used for the purposes of irrigation ; and, lastly, in answer to the statement that no bricks were burnt in the valley of the Nile, he quotes Mr. Birch as stating that he has under his charge, in the British Museum, two bricks, one a small rectangular baked brick, which came from a Theban tomb, the style of art, inscription, and date proving it to be as old as the eighteenth dynasty (about 1450 B.C.) ; secondly, another brick once forming part of an arch, having an inscription, partly obliterated, which he refers, conjecturally, to the nineteenth dynasty, or 1300 B.C.

Now, in answer to this, Sir Gardiner Wilkinson, one of the highest authorities on all matters relating to ancient Egypt, has urged (in reply to the observation) that the bricks and pottery being found in so many pits far from towns presents no difficulty, because of old, as well as now, wells were sunk at places far distant from towns and villages, even on the slope of the sandy desert, for the purposes of irrigation. Their distance from town, and the number of the wells, may be accounted for. Some were sunk, especially those near the desert, for watering the flocks, and for domestic purposes, the water being very frequently carried in jars to a great distance, and occasionally used for irrigation also.

To this I would venture to add the remark, that the borings and shafts were confessedly made on the site of an ancient town, which must have had a large population. Again, with respect to the two bricks in the British Museum, the same eminent authority denies that they are bricks which were ever used for the purposes of building. That the second spoken of never formed part of an arch. That they are burnt clay he admits. Their assumed date he does not dispute, but he states that they were never used for building purposes, and, like many other ancient Egyptian relics made of burnt clay, they do not at all invalidate the argument that no bricks were burnt for building purposes anterior to the Roman occupation of Egypt.

What, however, is still more to the point, this eminent authority, Sir Gardiner Wilkinson, has seen all the fragments upon which Mr. Horner has built his theory, and he states emphatically that he cannot attribute a high antiquity to any one of these fragments. The antiquity of several can be fixed. In page 59 of Mr. Horner's paper a list of objects found in the first shaft and deepest boring at the statue of Rameses II. is given. The fragment of a jar found at the depth of eleven feet has a stamped ornament on it, of the honeysuckle pattern, proving it to be of Greek workmanship, to which no higher antiquity than 200 years B.C. can be assigned. The glass mosaic from the depth of twelve feet is of late, probably

Roman, time. The blade of a copper knife, thirteen feet, is not of great age, and the small vase of white pottery, from a depth of fourteen feet, is of late, apparently of the Greek, period.

Most of the "objects of art" found near the statue of Memphis he decidedly pronounces to be of late time. To a head cut in greyish stone, brought up from a depth of forty feet at Memphis, he assigns no higher a date than the Ptolemaic period. In fact, he states that he saw no signs of any great age in any single fragment, while many were most decidedly of a late period, Ptolemaic or Roman.

In this way the strictures of the *Quarterly* reviewer as to the worthlessness of Mr. Horner's solution of the problem of man's antiquity are fully borne out. Indeed, Sir Charles Lyell himself seems convinced of it; for he neither gives Mr. Horner's rate of the secular increase of Nile mud at $3\frac{1}{4}$ inches per century, nor does he give his assumed antiquity of man at 13,371 years. He also admits the fallacy of Mr. Horner's method of determining the secular rate of the accumulation of the Nile mud.

"The ancient Egyptians" (says Sir C. Lyell) "are known to have been in the habit of enclosing with embankments the areas on which they erected temples, statues, and obelisks, so as to exclude the waters of the Nile; and the point of time to be ascertained in every case where we find a monument buried to a certain depth in mud, as at Memphis and Heliopolis, is the era when the city fell into such decay that the ancient embankments were neglected and the river allowed to inundate the site of the temple, obelisk, or statue. Even if we knew the date of the abandonment of such embankments, the enclosed areas would not afford a favourable opportunity for ascertaining the average rate of deposit in the alluvial plain, for Herodotus tells us that in his time those spots from which the Nile waters had been shut out for centuries appeared sunk, and could be looked down into from the surrounding grounds, which had been raised by the gradual accumulation over them of sediment annually thrown down. If the waters at length should break into such depressions, they must at first carry with them into the enclosure much mud washed from the deep surrounding banks, so that a greater quantity would be deposited in a few years than perhaps in as many centuries on the great plain outside the depressed area, where no disturbing causes intervened."

It is curious that while Sir C. Lyell gives neither Mr. Horner's secular rate of increase of the Nile mud nor the antiquity which he assigns to his fragments of brick and pottery, he gives M. Girard's rate of increase of 5 inches per century between Assouan and Cairo, although he states that Mr. Horner believes this determination to be founded on vague

and insufficient data; but adds, "Were we to assume 6 inches in a century, the burnt brick met with at a depth of 60 feet would be 12,000 years old."

Again, quoting from Mr. Horner's paper the statement of Linant Bey finding a fragment of red brick in the Rosetta branch of the Nile in the parallel of the Delta at a depth of 72 feet, then taking M. Rosière's mean rate of deposit in the Delta at 2.4 inches per century, and estimating this at 2½ inches, he says that this work of art must have been buried more than 30,000 years ago. To a superficial reader, Sir C. Lyell would seem to adopt these two dates of 12,000 and 30,000 years, because they are the only dates he gives in his account of the Nile deposit. Yet a careful perusal shows how carefully he guards himself, so that while an impression may be formed by the hasty reader that Sir Charles accepts these dates, he leaves us in doubt whether he agrees with Mr. Horner in rejecting them. But, if rejected, he must be taken as admitting that nothing whatever with regard to the antiquity of the human race has been determined by the Nile deposits.

If, however, the results of Mr. Horner's experiments go to prove anything at all, they give a much higher rate of annual increase of the Nile mud than has hitherto been assigned. If a work of Greek art not more than 2,000 years old has been brought up from a depth of 40 feet, this would give a rate of increase of 2 feet per century. This seems to be confirmed by a fact stated by Sir Gardiner Wilkinson. He has seen pieces of the alluvial deposit left on a rock and dried in the sun after one inundation. Such pieces assume a concave form almost like a piece of pottery, and are three-eighths of an inch in thickness; this, too, taken from rock at the extreme range of the inundation at Thebes, where it would be much thinner than on the plain, where the deposit would be greater. This would give 3 feet per century as the mean rate of deposit, an inference incidentally confirmed by a passage in Mr. Horner's paper, where he states, p. 68, "As a proof of the more rapid deposition of the heavier particles, even so low down as Cairo, I may mention, that at the ebb of the river after the inundation of 1853, it was found that the deposit on the Mastaba or landing-place of the Rhoda Nilometer, that is, at the 9th cubic mark on the column, was 6 inches in thickness; on the 4th step above it about 2½ inches; and on the 16th step not more than 1½, each step being rather more than 9 inches deep." Now, bearing in mind that Cairo is ten miles nearer the mouth of the sea than Memphis, three-eighths of an inch cannot be taken as an extravagant estimate for the annual deposit.

You will remember that when Professor Huxley preached us his lay sermon on Genesis xli. 38, 39, he stated dogmatically that the rate of the Nile deposit was one foot per century, and seeing that the Nile mud was in some places more than 70 feet deep, this would give us 7,000 years as the minimum period during which the Nile deposit above the delta has been accumulating. Now I maintain that we have good scientific reasons for dividing this sum by 3, or at any rate by 2. For I have as good grounds for asserting that the rate of accumulation is 2 or 3 feet per century as Professor Huxley has for assuming it to be 1 foot. Taking the smaller estimate, 3,500 years, even taking Ussher's chronology for the flood, gives me a good margin to allow for a few feet below the 70. Though I must remark, that at 40 feet, the boring near the statue of Rameses II. at Memphis passed through the alluvial deposit and entered the sand.

Could I not give such data as I have done for assuming the mean rate of deposit as much greater than one foot per century, I cannot see that Professor Huxley's sermon would gain much force. Supposing it could be proved, although I maintain that it has not been proved, that during the last 2,000 years the rate of increase has been no more than one foot per century, we are by no means able to assume that this has always been its mean rate. The Nile is subject to floods. In September, 1818, Belzoni witnessed one, where, although the river rose only $3\frac{1}{4}$ feet above its ordinary level, several villages, with hundreds of men, women, and children, were swept away by it. Professor Huxley reminded us that the ground through which the Nile now flows was once under the sea. The whole region through which the Nile runs must therefore have been elevated to its present height. Who, therefore, can venture to estimate the rate at which the newly-formed river would deposit mud in its course? Who can estimate the number of lakes in the highlands of Africa (from whence the Nile takes its rise)? Who can estimate how many of these lakes may have burst their bounds and poured at once a vast body of turbid water into the river? Only a few years ago a comparatively paltry body of water, dammed up as an artificial reservoir, near Sheffield, burst its banks, and in a few minutes carried havoc and destruction through a peaceful valley, uprooting trees, demolishing houses, and tossing about the heaviest iron tilt-hammers and machinery like chips of wood. A few minutes served to fill the lower stories of houses miles from the reservoir, and even at a good distance from the river bed, with a deposit of more than a foot of mud. Sir Charles Lyell has given a vivid descrip-

tion of the bursting of a lake in his *Principles of Geology*. The upper portion of the valley of Bagnes was converted into a temporary lake by the damming up of a narrow pass by avalanches of snow and ice, precipitated from an elevated glacier into the bed of the Dranse. The lake was half a league in length, 700 feet wide, and 200 feet deep in some places. Half the contents of this lake were quietly drained off by an artificial channel,*

"But at length, on the approach of the hot season, the central portion of the remaining mass of ice gave way with a tremendous crash, and the residue of the lake was emptied in half an hour. In the course of its descent, the waters encountered several narrow gorges, and at each of these they rose to a great height, and then burst with new violence into the next basin, sweeping along rocks, forests, houses, bridges, and cultivated land. For the greater part of its course the flood resembled a moving mass of rock and mud, rather than of water. Some fragments of granitic rocks of enormous magnitude, and which from their dimensions might be compared, without exaggeration, to houses, were torn out of a more ancient alluvion, and borne down for a quarter of a mile. One of the fragments moved was sixty paces in circumference. The velocity of the water, in the first part of its course, was thirty-three feet per second, which diminished to six feet before it reached the Lake of Geneva, where it arrived in six hours and a half, the distance being forty-five miles.

"This flood left behind it, on the plain of Martigny, thousands of trees torn up by the roots, together with the ruins of buildings. Some of the houses in that town were filled with mud up to the second story. After expanding in the plain of Martigny, it entered the Rhone, and did no further damage.

"Now," continues Sir C. Lyell, "if part of the lake had not been gradually drained off, the flood would have been nearly double, approaching in volume to some of the largest rivers in Europe. It is evident, therefore, that when we are speculating on the excavating force which a river may have exerted in any particular valley, the most important question is, not the volume of the existing stream, nor the present levels of its channel, nor even the nature of the rocks, but the probability of a succession of floods at some period since the time when the valley may have been first elevated above the sea.

"For several months after the débâcle of 1818, the Dranse, having no settled channel, shifted its position continually from one side to the other of the valley, carrying away newly-erected bridges, undermining houses, and continuing to be charged with as large a quantity of earthy matter as the fluid could hold in suspension."

* Lyell's *Principles of Geology*, vol. i. p. 364, 6th edition.

After this caution on the part of Sir Charles Lyell, one which he so strangely neglects himself, we cannot be deemed unscientific or unduly instructed if we refuse to admit that any scientific proof has been given that the Nile valley is any older than the most recent period assigned to the Noachian Deluge.

With regard to Sir Charles Lyell's assumed age of 100,000 years as the minimum time in which the Mississippi delta has taken to accumulate, and Dr. Dowler's estimate of 50,000 years for the antiquity of the skeleton found sixteen feet deep in Mississippi mud, I cannot do better than quote from Professor Kirk's admirable little work, *The Age of Man Geologically considered in its Bearing on the Truths of the Bible*. [London: 1866.]

"The most important of all the accumulations of mud to which attention has been called in connection with the age of man upon the earth, is that formed by the Mississippi. The delta of this great river covers an area of many thousand square miles. It has required, according to an estimate of Sir Charles Lyell, above 100,000 years for its formation. If we assume that the delta in question is on an average of 200 feet deep, this estimate will call for 500 years as the time for adding a single foot to its surface! only the one-fifth part of a foot, less than two inches and a half, in a century! less than the fiftieth part of an inch in a year! The reader will observe how the power of fancy grows in this wild logic.

"First, the thirty-second part of an inch in a year—then the fortieth part—now the fiftieth part! Can any man in his senses soberly look at this as matter of fact and worthy of being associated with the name of science? Yet we shall see that all-important conclusions are derived from it. In one part of this delta, at a depth of sixteen feet from the surface, 'beneath four buried forests, Dr. Dowler found some charcoal and a human skeleton.' The worthy Doctor ascribes to this man, whose skeleton was thus found, an antiquity of 50,000 years! Sir Charles Lyell says that he 'cannot form an opinion as to the value of the chronological calculations' by which this result is gained. We think he might be able to form a very strong opinion on the subject if he were earnestly disposed. First of all to take the growth of the mud—50,000 years for sixteen feet! This beats Sir Charles with his 100,000 years for the several hundreds of feet in the whole delta, and beats him hollow. But then there are 'four forests,' only these are packed in less than sixteen feet of space, for we must allow something to have lain above the uppermost of the four. If these 'forests' grew on the spot we must have soil for each to grow in, as well as space in which it could lie, and all this in less than sixteen feet! Yet we must give 50,000 years to this miniature formation in geology. A stream capable of burying forests so as to pack four of them in less than sixteen feet of vertical space when forming its delta, is to be, nevertheless, allowed not less than five centuries to lay down twelve

inches of mud on the surface! And we are to regard all this as sober science, destined to lead us to greatly 'advanced religious views,' and as far beyond the teachings of Moses as the 'educated classes' could wish to be ahead of the common multitude! We have had to read Sir Charles's statements over and over many times in order to believe our own eyes that he had really published to the world such monstrous examples of speculation. And yet such is the fact; with the solemn gravity of a high priest of science he spreads out his marvellous cogitations, and satisfies, too, the credulous souls, who will trust anything rather than the Bible, that man has been on the earth for hundreds of thousands of years!

"Let us just take one fact adduced by Sir Charles Lyell himself, and one which is pregnant with force against these reckless speculations. Speaking of a fossil bone which was found near Natchez, he says:—'Owing to the destructible nature of the yellow loam, every streamlet flowing over the platform has cut for itself, in its way to the Mississippi, a deep gully or ravine.' He mentions one of these ravines which is seven miles long, and in some places sixty feet deep, which had no existence before 1812. There was an earthquake at that date which shook the land all about Natchez, and so far accounted for some of those fissures that had been cut so deeply; but Sir Charles saw when he was there that the streams were widening and deepening all their channels, and consequently carrying immense quantities of mud into the river, which was in its turn bearing it on to its delta in the Gulf of Mexico. Yet he could coolly calculate that all this would allow of only something less than the fiftieth part of an inch of sediment laid on the surface of that delta in an average year!"

If any one wished for an exemplification how one part of the writings of Sir Charles Lyell may be brought to contradict another, and how his facts controvert his theories, I would refer him to this masterly little book of Professor Kirk's which I have just quoted.

I cannot pass from my present subject of the great antiquity assumed for Egyptian civilization without referring to an instance in which that antiquity was sought to be proved on the strict scientific grounds of astronomical demonstration, and how it melted away before an accurate investigation. On the ceiling of the portico, and also on the ceiling of one of the apartments of the large temple at Denderah, in Upper Egypt, the best preserved and one of the most splendid of Egyptian ruins, the French *savants* supposed that they recognized the signs of the Zodiac.

"Dupuy and other French writers assumed from the relative position of those Zodiacal signs, and their connection with the precession of the equinoxes, that the astronomical observations upon which these Zodiacs were constructed, must refer to a date far more ancient than that recorded for the

Deluge, or even the creation of man ; not less, indeed, than 15,000 years, according to some."

Yet an accurate investigation has proved that these assumed Zodiacs are no Zodiacs at all ; that the temple itself bears inscriptions proving incontestably that it is not older than the first century of the Christian era.

I shall now proceed to consider some of the difficulties which have been urged from the science of geology, to the inspiration of the writings of Moses. These difficulties have not arisen from the facts of geology, but from the hasty interpretation of the facts ; from theories and hypotheses, ever changing, and all seemingly doomed to very short duration. I know no science in which the precepts of Bacon have been more neglected, in which the philosophy of the sound inductive method has been more disregarded. The injury done to science by hasty generalizations and theories founded on insufficient data are best stated in Bacon's own words.

" Another error " (says Lord Bacon, in his *Advancement of Learning*), " of a diverse nature from all the former, is the over-early and peremptory reduction of knowledge into arts and methods, from which time commonly sciences receive small or no augmentation. But as young men, when they knit and shape perfectly, do seldom grow to a further stature, so knowledge, while it is in aphorisms and observations, is in growth ; but when it once is comprehended in exact methods, it may perchance be further polished and illustrated, and accommodated for use and practice, but it increaseth no more in bulk and substance. Another error hath proceeded from too great a reverence and a kind of adoration of the mind and understanding of man, by means whereof men have withdrawn themselves too much from the contemplation of nature, and the observations of experience, and have tumbled up and down in their own reason and conceits. Upon these intellectualists, which are notwithstanding commonly taken for the most sublime and divine philosophers, Heraclitus gave a just censure, saying, ' Men sought truth in their own little worlds, and not in the great and common world,' for they disdain to spell, and so by degrees to read, in the volume of God's works ; and contrariwise, by continual meditation and agitation of wit, do urge and as it were invoke their own spirits to divine and give oracles unto them, whereby they are deservedly deluded."

I shall endeavour to make good my assertion regarding the science and progress of geology.

One great fact is admitted by all geologists, that there is no part of the now dry land which did not once lie below the sea. This fact fully bears out the words of Moses, " And the earth was without form and void, and darkness was upon the face of

the deep, and the spirit of God moved upon the face of the waters." (Gen. i. 2.) "And God said, Let the waters under the heaven be gathered together into one place, and let the dry land appear, and it was so." (Gen. i. 8.)

Until recently the generally received geological theory has been this:—The lowest parts or foundations of the earth consist of unstratified rocks, called plutonic, all of igneous formation. Above these lie the metamorphic, or stratified crystalline rocks, containing, like the former, no trace of organic life. These are assumed to have had an aqueous formation, but to have become crystalline and lost all traces of organic structures by the action of heat. Above these, the strata, all sedimentary in character, are divided into three great divisions—primary, secondary, and tertiary. Each of these again into numerous subdivisions. These strata lie over one another always in the same order, though they are frequently raised from the horizontal position to every angle up to the perpendicular. Many of these strata are often altogether wanting. Any one may form the surface of a country, and frequently the plutonic rocks themselves are quite bare and destitute of any overlying strata. The strata are not distinguished from one another by any certain mineralogical or lithological characteristics, their age and position being determined by the organic remains they contain. To their gradual formation millions of ages have been assigned. Until very recently (except by a few geological heretics) they were supposed to indicate as many successive creations as they contained distinct fauna, man and the present vegetable and animal inhabitants of the world not making their appearance in the geological records till the post-tertiary period.

To account for the varied appearances, contortions, inversions, and breaks in these fossiliferous strata, the now dry land, was at one time supposed to have been at the bottom of the sea; then to have been raised above the waves; its coasts worn away by the sea, and its hills denuded by rainfalls; then depressed again below the ocean for many fathoms; this process repeated again and again; the temperature at one time that of the torrid zone, and another of the arctic regions; most places at one time lying under an ocean teeming with melting icebergs, or else overlaid by vast glaciers. This may be called the successive creation theory. It met for a long time with almost universal acceptance. It presented little or no difficulty to the theologian; as Dr. Buckland's interpretation of the first chapter of Genesis was supposed to reconcile all difficulties. All these changes took place in that vast period which, on the authority of great Hebrew scholars (maintained

long before geology was dreamt of), was held to lie between the first verse of Genesis—"In the beginning God created the heavens and the earth," and the second verse, "And the earth was without form and void, and darkness was upon the face of the deep,"—the six days of the Mosaic creation having only reference to man's appearance on the earth, together with the existing fauna of animate life. Has this successive creation theory been founded on insufficient data—on hasty generalization combined with too little acquaintance with the fossiliferous remains of the earth's strata, and the creatures at present inhabiting the globe? Sir Charles Lyell answers this question in the affirmative in his recent editions of the *Elements of Geology*. I know of no instance in which this theory has tended to the progress of geological knowledge. Sir Charles Lyell admits that it has had a retarding effect. During the whole time this theory has been fashionable, facts have been burked and pooh-poohed. No geologist of eminence, no scientific man of known reputation, held any other, was the answer to every heretic who adduced any awkward facts in contradiction. Take, for instance, the association of man with the extinct gigantic mammalia.

"The stories," remarks Sir Charles Lyell (*Antiquity of Man*, p. 34), "widely circulated of the bones of the mastodon having been observed with their surfaces pierced as if by arrow-heads, or bearing marks of wounds, inflicted by some stone implement, must in future be more carefully inquired into, for we can scarcely doubt that the mastodon in North America lived down to a period when the mammoth co-existed with man in Europe." *Antiquity of Man*, p. 95 :—"A correct account of the associated flint tools, and of their position, was given in 1847 by M. Boucher de Perthes in his work above cited, and they were stated to occur at various depths, often twenty or thirty feet from the surface, in sand and gravel, especially in those strata which were nearly in contact with the subjacent white chalk. But the scientific world had no faith in the statement that works of art, however rude, had been met with in beds of such antiquity." *Antiquity of Man*, p. 104 :—"After a lively discussion on the subject in England and France, it was remembered not only that there were numerous recorded cases leading to similar conclusions in regard to cavern deposits, but also that Mr. Frere had, so long ago as 1797, found flint weapons of the same type as those of Amiens in a fresh-water formation in Suffolk, in conjunction with elephant remains, and nearly a hundred years earlier (1715) another tool of the same kind had been exhumed from the gravel of London, together with the bones of an elephant."

Speaking of the human bone accompanying bones of the

mastodon found at Natchez, on the Mississippi, Sir Charles Lyell (*Antiquity of Man*, p. 200) makes this candid admission :—

“ After visiting the spot in 1846, I described the geological position of the bones, and discussed their probable age, with a stronger bias, I must confess, as to the antecedent improbability of the contemporaneous entombment of man and the mastodons than any geologist would now be justified in entertaining.”

Sir Charles Lyell, in the 27th chapter of his *Elements*, 1865, has shown how progressive has been the march of discovery in finding relics of supposed more recent creations among those of the older. I cannot detain you by quoting as fully as I could wish. I will confine myself to one extract only :—

“ There are many writers still living who, before the year 1854, generalized fearlessly on the non-existence of reptiles in times antecedent to the permian ; yet in the course of nineteen years they have lived to see the remains of reptiles of more than one family exhumed from various parts of the carboniferous series. Before the year 1818, it was the popular belief that the palæotherium of the Paris gypsum and its associates were the first warm-blooded quadrupeds that ever trod the surface of this planet. So fixed was this idea in the mind of the majority of naturalists, that when at length the Stonesfield mammalia were brought to light, they were most unwilling to renounce their creed. First the antiquity of the rock was called in question, and then the mammalian character of the relics.”

The successive creation theory is thus acknowledged again and again by Sir Charles Lyell to have been always obstructive, never helpful, to the progress of geology.

But it has not only been crumbling before facts linking together the supposed successive strata, by carrying down the higher forms of life to lower strata ; below the tertiary nearly all strata are more or less pelagic in their origin. The medals of creation most abundant, and determining their specific character, are the shells and other creatures of marine origin. The progress of discovery has been equally steady in discovering among existing species those thought to be long extinct. No species of the terebratulæ were supposed to exist till the late Captain Ince dredged some up from the harbour of Port Jackson, and only last summer twenty specimens of terebratulæ were found off the island of Skye, showing the wide distribution in our present seas of a creature supposed to be extinct.

Every geologist must admit how imperfectly the geological records available to man's inspection have yet been read. Every naturalist will tell you how little really we know of the denizens of the sea. Who can tell what marine saurians may

still sport themselves among the meadow-like verdure of the vast Sargasso seas?—the Atlantic, one little less in area than the surface of Europe, teeming with vegetable life, being, for the most part, green as any meadow, and covering the ocean as with an emerald mantle, where sea-weeds float with stems 800 feet long. The progress of geological discovery is breaking down, and rendering the successive creation theory no longer tenable. Yet with all this progress we find no traces of successive development. Mr. Darwin can find no proof of his favourite theory in any known geological records of the earth's history. He confesses that he can only expect to find his negative evidence in strata hereafter to be explored far beneath any strata yet investigated. Sir Charles Lyell would seek for the same negative evidence of the ape's transformation into man in unknown geological strata!

But what can be more unphilosophical than theories which depend, not on facts, but on negative evidence—that is, simply on the dreams of man's imaginative faculty? The actual progress of geology leads us only to the unity of the creation. It gives no countenance to any progressive development. The lowest forms of the supposed most ancient strata have not made the slightest progress. Their congeners—nay, in many instances the same identical species—swarm in our existing seas without showing the slightest trace of modification or progress. The foraminifera, dredged from the bottom of the Atlantic, and now flourishing abundantly on the surface of the Atlantic, are specifically identical with those whose fossils are so abundant in the cretaceous formation of Europe. Sir Charles Lyell says, in his *Elements*, p. 318:—

“That white chalk is now forming in the depths of the ocean may now be regarded as an ascertained fact, because the *Globigerina bulloides* is specifically undistinguishable from a fossil which constitutes a large portion of the chalk of Europe.”

But what, I would ask, must fall with the successive creation theory? If all geological strata contain only the records of one creation—if there be no proof, but rather the contrary, of any new creation, of the successive appearance of any new species, the originals of the present earth's fauna must be as old as any creatures whose remains can be found in the marine-formed strata of the earth. The fossil medals of creation must, with the fall of the successive creation theory, fail to give any record of the time when they were stamped in Nature's mint—at any rate, till some sure evidence be found on which the development theory can rest.

But then I shall be reminded that the upheaval of our present land, and the depths of the strata filled with marine fossils, must have taken an incalculably lengthened period of time. To which I reply that science can give no proof of this lengthened period.

Sir Charles Lyell states $2\frac{1}{2}$ feet per century as his normal period for the elevation of land above the sea.

Sir Charles states (*Antiquity of Man*, p. 58):—

“The upward movement now in progress in parts of Norway and Sweden extends, as I have elsewhere shown, throughout an area about 1,000 miles N. and S., and for an unknown distance E. and W., the amount of elevation always increasing as we proceed towards the North Cape, where it is said to equal 5 feet in a century. If we could assume that there had been everywhere an average rise of $2\frac{1}{2}$ feet in each 100 years for the last 50 centuries, this would give an elevation of 125 feet in that period.” “A mean rate of continuous vertical elevation of $2\frac{1}{2}$ feet in a century would, I conceive, be a high average; yet even if this be assumed, it would require 24,000 years for parts of the sea-coast of Norway, where the post-tertiary marine strata occur, to attain the height of 600 feet.”

This unit measure of $2\frac{1}{2}$ feet per century elevation is that which Sir Charles Lyell uses everywhere throughout his *Antiquity of Man*, to estimate the period land has taken to be elevated. But this unit is purely theoretical and conjectural, having, in all probability, as much foundation in fact as the $2\frac{1}{2}$ inches of increase in Nile mud per century. Let us test the theory by fact, Sir Charles himself being the witness cross-examined.

Speaking of the rise of 1,000 miles of the coast of Chili after the earthquake of 1822, he says (*Principles*, vol. ii. p. 304):—

“By some observers it has been supposed that the whole country from the foot of the Andes to a great distance under the sea, was upraised in 1822, the greatest rise being at the distance of about two miles from the shore. ‘The rise upon the coast was from 2 to 4 feet; at the distance of a mile inland it must have been from 5 to 6 or 7 feet.’ It has also been conjectured by the same eye-witnesses to the convulsion, that the area over which this permanent alteration of level extended may have been equal to 100,000 square miles.”

Prodigious! Theory, $2\frac{1}{2}$ feet per century. Experience of eye-witnesses, twice that on the coast, and a mile inland more than three times that amount, in a few hours of time. Again, let us take the evidence of eye-witnesses of the effects of the earthquake of 1835 on the same coast. I quote from Mr. Darwin’s *Journal*, p. 310:—

“The most remarkable effect of this earthquake was the permanent eleva-

tion of the land. There can be no doubt that the land round the Bay of Concepción was upraised 2 or 3 feet; at the island of St. Maria (about 30 miles distant) the elevation was greater; on one part Captain Fitzroy found beds of putrid mussel-shells still adhering to the rocks 10 feet above high-water mark, where the inhabitants had formerly dived at low water spring-tides for these shells."

After this testimony of "experience" *versus* "theory," a man must be a bold one who would take any upheaval theory as a basis for a chronometrical scale of geological ages.

Again, we have the vast depths of certain strata, the chalk, for instance, formed for the most part of the skeletons of minute infusoria, foraminifera, diatomaceæ, and other creatures. These, we are told, must have taken myriads of ages to form. Ehrenberg estimates that there are 41,000 millions of the silicious skeletons of diatomaceæ in one cubic inch of Bilin tripoli. That gives a little cube, each of its sides being the ten-thousandth part of an inch in size, for each of these remains. Some say the chalk foraminifera are smaller than these diatomaceæ. Let us take their little cubes as one hundred-thousandth part of an inch, then we shall have 10^{15} , that is, 1 followed by 15 ciphers, for the number packed in a cubical inch of chalk formed solely of their remains. Surely the cretaceous strata of Europe, formed by such minute creatures, must have taken myriads of ages in its formation. Let us test this by a little arithmetic. We will suppose one foraminifera created, in one year to produce 10 others, each of these 10 more the next year, each of these 10 the next year, and so on, multiplying tenfold each year; at the end of any given year the number produced will be 10^{n-1} , n being the number of the years elapsed.

The number of cubical inches in a cubic mile lies between 10^{14} and 10^{15} . Taking the larger of these two figures for convenience in calculation, 10^{15} multiplied by 10^{15} , equalling 10^{30} , will give the number of foraminifera in a cubic mile. Multiplying this number by 10^{16} , we shall have 10^{46} for the number of foraminifera covering an area of 100 million of square miles a mile in height. Hence, the foraminifera produced in the 47th year alone would cover more than an area of 100 million of square miles a mile high. Less than half a century. Now, if I had taken days instead of years for the probable average duration in which the generations of foraminifera multiply, and if I had taken their increase as a hundredfold instead of tenfold, I might not probably have erred from the facts of nature. But it will be objected that long before such a rate could be reached, food for the nourishment of the foraminifera

would fail. Granted. What then? The possible increase of the foraminifera is only practically diminished by their supply of food failing, and the rate in which their enemies devour them. Any way, hundreds instead of myriads of years is all that arithmetical computation can afford us as a clue by which to estimate the time the cretaceous formation of Europe might probably take to form.

Practically, we know too little about what is now forming in the depths of the Atlantic and Pacific oceans, miles below the surface, to have any conception of the changes that may take place in the depths of the sea. We cannot guess the rate at which strata may accumulate. What would a man know of the surface of the earth if he had been all his life sailing in a balloon, and never approaching that surface nearer than two or three miles? Suppose his knowledge of this surface was derived from a few quillfuls of earth drawn up from it. This is no exaggerated account of all we know of deep-sea bottoms. We know that vast currents run, not only on the surface of the sea, but circulate through its depths. We know not the power of sub-aqueous storms in these currents. We know not how they may lift sedimentary deposits from one part of the ocean-bed and lay them over other strata. We know not how these currents may pile strata after strata of material round the rugged sides of submarine mountains at all kinds of inclinations. Knowing this vast depth of human ignorance, surely this should be a reason why we should display profound humility while we learn to spell and by degrees to read in the volume of God's works—why we should not substitute for this discipline a false worship and adoration of the mind and understanding of man.

The shafts of ridicule have been urged against those well-meaning men who have from time to time endeavoured to make the writings of Moses square with the fashionable theories of geologists. But why have they failed? Because they have been too credulous in accepting unproved hypotheses as scientific verities.

But now, when the incandescent state of the earth, passing through all stages from a flaming vapour to crystallizing granite, with indefinite ages for the cooling process, is ruthlessly committed to the limbo of exploded hypotheses; when the Huttonian theory of the igneous formation of granitic and other kindred rocks gives place once more to the water formation of Werner; when the successive creation theory, with all its power of determining age of strata by their palæontological remains, seems melting before the inexorable logic of facts; while the Darwinian or rather Lamackian theory of progres-

sive development can claim no solid foundation in nature to rest on, but only the assumed force of negative, that is, imaginary evidence; the believer in revelation may well pause when asked to make revelation square with theoretical geology. He can wish the investigator of geological facts God-speed while he investigates the relics of the past, and wait patiently the collection and digestion of such a body of facts as may render speculation less hazardous than it has hitherto been, in attempting to construct the history of the past from the records it has left in the earth's strata.

[When this Paper was read in Sion College, there was introduced at this place an argument in favour of the evidences of design to be observed in nature, which was omitted in reading the Paper in the Victoria Institute, as the omitted passages had been previously delivered in the Institute, in Mr. Mitchell's Inaugural Address.—*Vide* vol. i. of the *Journal of Transactions*, pp. 54 to 68.]

The assertion "that the gradual reduction of all phenomena within the sphere of established law carries with it as a consequence the rejection of the miraculous" (upon which assertion modern rationalism has invaded the domain of theology and natural philosophy), has only to be brought face to face with the highest inductions of modern science to meet its own refutation. We are not required to banish God, to banish a Creator from the physical world, to cultivate with freedom the revelations of modern science. The assumed laws which replace design by rigid fate crumble before a calm dispassionate investigation. As men of science we can believe not only that God created us; but we can confess, with heathen poets of old, that "we are His offspring," seeing that "in Him we live and move and have our being." That no disbelief in the miraculous, no knowledge of correlation of forces, no conservation of *vis vitæ*, compels us to deny that "He left not Himself without witness in that He did good, and gave us rain from heaven, filling our hearts with food and gladness." Our philosophy still allows us with simple hearts to pray "Give us this day our daily bread." We can still believe that no sparrow can fall to the ground without our heavenly Father's knowledge and will. Nay, the more we know, the more deeply we investigate the phenomena of nature, the more are we compelled to admit our own ignorance. "Hardly do we guess aright at things that are upon earth, and with labour do we find the things that are before us." Laws of nature, we confess with Hooker, have in them "more than men have as yet attained to know, or perhaps ever shall attain, seeing the travail of wading herein is given of God to the sons of men,

that perceiving how much the least thing in the world hath in it more than the wisest are able to reach unto, they might by this means learn with humility." Humbly we confess with Bishop Butler, "other orders of creatures may perhaps be let into the secret counsels of Heaven, and have the designs and methods of Providence in the creation and government of the world communicated to them, but this does not belong to our rank and condition."

The CHAIRMAN.—You will allow me to thank Mr. Mitchell for his very able paper. It is another of the valuable contributions that he has made, not only in support of revealed truth, but in support of science; indeed, it is more eminently in support of science than of revealed truth. I now invite discussion upon the paper, for which we all thank Mr. Mitchell heartily. (Applause.)

R. BAXTER, Esq.—I should like to mention a fact or two that relate to the law of deposits. Having had considerable means of observation on the borders of the great tidal river the Trent, I may mention a few circumstances in order to show why we observe the laws of currents and deposits. We have on the borders of that river more than 20,000 acres under the level of the sea, and we take means to let in the tidal waters on this land, in order to make a deposit of the mud carried in the stream, and so improve the land. We do this statedly year by year, and it is a regular trade and profession. A man embanks about 300 or 400 acres, gets the water all about that area, and the principal thing at which he aims is to get the deposit of mud equally distributed. In effecting this work, he cannot help observing the law of deposits. He finds that there is always a certain quantity of deposit, if even the stream is running at the rate of three miles per hour; but according to the strength of the stream so is the quantity of alluvial matter carried. I have seen instances, when the spring tides have been coming up, where the earth has been carried in such large flakes that you might have put your hand in and gathered a great lump of the mud which the stream was carrying away. When the strength of the stream is retarded, then the deposit most rapidly takes place; and when it is let into an embanked area it becomes perfectly still, and the deposit of the substances then takes place. We see in the river Trent islands formed in 20, 30, 40, or 50 years, and in the next 20, 30, 40, or 50 years they are carried away. And why is this? Because the current has changed. In the system that I have described, and called "warping," banks are made here and there to change the current, by which means that which has been deposited is often carried away. How totally unreliable must be any law of deposits by inches or feet in a century, when we remember how, on the principle I have described, one year's flood, if it is higher than usual, will carry away the deposits of previous years, and settle them perhaps lower down the stream, where the river is more quiet, owing to the extended area over which it has to flow! I have seen, among the results of changing and checking currents, where drains, 150 yards long,

30 or 50 yards wide, and 15 feet deep, have been filled up to the extent of six feet in a single year ; and you will find frequently six feet of level deposit laid in one of those channels in a single season, and sometimes six inches will be laid in one set of spring tides, which I think are generally reckoned to number three, or four, or five. Seeing, then, that deposits depend on the continuity or interruption of a stream, there can be no law of deposits, especially when the flow of that stream often depends on accidental circumstances. (Hear, hear.) There is another fact supplied by this district which affects the question of coast elevation. This very district of which I have been speaking, extending over about 20,000 acres, has not been elevated, but depressed. It was, in fact, once a forest, and the farmers dig up the trees *in situ*, split them, and carry them into the market towns for kindlings [firewood]. If the sea was to be let in over that area it would cover it to a depth of six or eight feet. How, then, could the forest have grown there at the present level ? And we know there have been no artificial embankments to keep the tide out, excepting those which have been very recently made. The country has been depressed, and altered its level ; and it is because of that depression that we can carry on the system of warping, and at the end of two years or so improve land worth ten shillings an acre till its value is fifty shillings an acre. There is thus a law of depression as well as a law of elevation, and in studying this question we should remember the operation of those laws. It is only by treating geology in this way—first the fact and then the inference—that you can arrive at anything like reliable results. If we take the inference without the fact we are sure to be wrong, and unquestionably we have of late been doing what is very like that. We have been too rapid in the formation of our theories ; we have reduced them to form and moulded a system, and now that facts are breaking in upon us they are completely destroying our system, and we have to begin our learning anew. (Applause.) We ought to be much obliged to Mr. Mitchell for his very able paper ; and I trust that we shall have other papers of that kind from time to time.

Mr. BROOKE, C.E.—I have been largely engaged for twenty-four years in the navigation of rivers, and I, too, can speak of the effects of currents upon deposits. A reference was made to the Nile. The International Committee report that in the borings for the Suez Canal marine shells were found of the same kind as those which now exist in the Red Sea. The deposits of the Nile are sometimes spoken of as though they were only deposits of mud ; they are vast deposits of sand—

The CHAIRMAN.—Would you be good enough to state whether you are speaking of the bed of the river, or of the Delta ?

Mr. BROOKE.—If you wish to consider the deposit higher up above Cairo, you must remember the effect of damming up the stream. The works of recent pashas must of necessity have had their effects upon the deposits both above and below, and we know not but that similar works may have existed in times gone by. I repudiate the notion that we are called upon to believe the theories which Mr. Mitchell has so ably combated.

Mr. WADDY.—I do not for a moment mean to say that we are to suppose the rate of deposit in the Nile can be judged by the rules of deposit as applied to the Trent. To compare the two, you must discover whether the consistency of the deposit is the same in the two streams ; and if even you have discovered and settled that point, it does not follow that you have got a law of deposits that will carry you through centuries. There is not the slightest reason for believing that the rate of deposit now is the same that it was a hundred years ago. Your deposit now may be at the rate of a single inch per year, but it does not follow that it was the same 20 or 2,000 years ago. I am told by those who are well able to judge that nothing is more clearly proved than this in warping, that the earlier deposits are a great deal thicker than the later ones, because of the greater depth of water and the greater quantity of mud that would be brought down the stream in its earlier flowings. When the channel is new there is more mud washed down than when it is old ; and where there is less water there is less deposit. Supposing the date of the statue to be quite fixed, and the borings to be relied upon, you are no nearer the truth, because, as I have just said, you have not and cannot have a knowledge of the variable rate of the deposit. There is another fact to be borne in mind. The deposit only takes place after the river begins to rise, and then it is not in the channel, but in the calm beyond the banks. Within twenty-four hours after the occurrence of the dam-accident near Sheffield I saw the scene of the catastrophe, and I did not see such a deposit in the bed of the torrent, whereas up the sides of the valley it was six or seven inches thick. The best authority that I can find on this matter tells me that it is utterly impossible to form any notion whatever, or any average, of the deposit of alluvial matter, there are so many contributing and conflicting causes,—the speed of the stream, the depth, and the quantity of mud carried in it. If the stream is higher than usual, it washes away the deposit of former years. I quite coincide with all that has been said of the value of this paper, but I don't quite think Mr. Mitchell should say that Professor Huxley stated dogmatically that the rate of deposit was one foot per century ; he believes five inches, but for the sake of argument he says one foot.

Mr. MITCHELL.—Yes ; I confess that is so, but I thought it was obvious that I started from the same ground that Professor Huxley adopted.

Mr. WARINGTON.—I should like to make a few remarks on two points, the Nile deposits and chalk. As to the Nile deposits, I would throw out a suggestion by which this question of the average rate of deposit might be settled, independently of borings or measurings. If samples of the water brought down the stream before any deposit takes place were bottled, and other samples were taken during and after the deposit had begun, and these observations were made from year to year, you might get a fair average of the quantity of sediment ; the bulk of water and the area over which it flowed might also be discoverable, and you might then get some clue as to how long the Nile deposit has been accumulating. Then as to the chalk. Here I must join issue with Mr. Mitchell entirely, for he has overlooked one

most important element in his problem. He alludes to the food of the foraminifera. Now, part of that food must be of a peculiar character. The shells of these foraminifera which form the chalk are made up of carbonate of lime. That carbonate of lime must have been in solution in the water in order that they might assimilate it and form it into shell. The only form, so far as we know, in which carbonate of lime can be thus assimilated from water, is its solution in carbonic acid. As carbonate of lime dissolved in carbonic acid, then, must all the chalk have first existed in the water before the foraminifera could appropriate it to form their shells. But here we have at once a limit to their multiplication. Directly the carbonate of lime falls off, their growth and increase must fall off too. Now, the quantity of carbonate of lime which water, even when saturated with carbonic acid, is capable of holding in solution is but small. Even supposing the whole sea to be thus saturated, only a thin crust of carbonate of lime would be formed by the removal of the carbonic acid. Nor, if the deposition of the carbonate of lime took place through the agency of foraminifera, would the amount of rock so formed be any greater. The carbonate of lime thus removed, the increase of foraminifera would be altogether stopped, except a fresh supply could be obtained. This supply cannot arise from the solution of fresh carbonate of lime within the sea itself, because if there be free carbonic acid sufficient for this end it would dissolve, not only any limestone that might be there, but also the shells of the dead foraminifera themselves, and thus in another way put a stop to their accumulation. Whence, then, can the supply come? It can come certainly from the rivers, which are constantly bearing down carbonate of lime in solution into the sea. But, then, the supply from this source is very small as compared with the bulk of chalk to be formed. Taking all these points into consideration, it seems to me utterly incredible that the vast masses of chalk now in existence could have been formed in the time, or anything like the time, that Mr. Mitchell is disposed to allow. Had I known that the point was coming up in the paper to-night, I would have gone into the matter more exactly, but as it is, I am of course only able to deal with it roughly and in general terms.

Professor MACDONALD.—Am I to suppose that Mr. Mitchell objects to the successive creation theory?

Mr. MITCHELL.—I have only given what Sir Charles Lyell himself says; I have taken him as my authority, and I agree with him that the whole evidence of modern geology is tending against the successive theory.

Professor MACDONALD.—I probably may not know what that means, but I do not suppose that you maintain that the whole crust of the earth is the result of one instantaneous creation?

Mr. MITCHELL.—I do not say that it was. What is described as the successive creation theory is this (I will take what Professor Huxley himself has said), that there are three great divisions—primary, secondary, and tertiary—and that they indicate three distinct creations. The animals therein—the animals of the cretaceous period, for instance—are essentially distinct from the animals of the carboniferous period, and so on.

Mr. REDDIE.—But although Professor Huxley has said that, it should be remembered that he does not believe in the successive creation theory himself, for he is an avowed Darwinian. (Hear.) Without at all intending to controvert what has been so well said, as to the absolute impossibility of predicting any uniform rate of deposit of mud, from the irregularity of such deposits, as is shown by experience from the system of warping which has been described by Mr. Baxter and Mr. Waddy; and not entering on the proposition of Mr. Warington, that you should bottle off the water of the Nile with the mud in solution in order to ascertain how much might annually be deposited; I will venture to take Professor Huxley on his own argument, that the *same quantity* of mud is brought down every year by the Nile, and that therefore the *same depth* of mud is deposited year by year; and I say that conclusion is totally wrong. I might argue that this is an utter impossibility, if we consider merely the varying depth of the water, as has been pointed out by Mr. Waddy; but even if we assume that the whole waters of the Nile from the first year in which they commenced their flow, down to the present time, have been the same, and have yearly brought down the same quantity of mud, still the depth of the mud-deposit could not possibly be the same now as it formerly was. The fact is, that the basin of the Nile is narrower at the bottom than at the top, so that even if you have the same *quantity* of mud flowing down now that used to flow in former times, the deposit at the bottom of the basin before its width had been increased could not possibly be merely the same as it is now, when the area of the basin which has to be covered by the mud is so very much greater than formerly. The oldest deposits in the narrower basin must necessarily have been deepest. But it is also clear, from what has been said by Mr. Waddy and Mr. Baxter, that the quantity of mud in one part of the stream will be smaller or greater than it is in another part, according to the variations of the force of the currents at different times and places, so that even if Mr. Warington could bottle off the whole of the Nile (laughter), I do not know how he could ascertain the annual rate of deposit in the way he anticipates. With reference to Mr. Mitchell's valuable paper, there is one point to which I would beg leave to take exception, relative to the Denderah planisphere, although I doubt whether any argument of value as regards the present discussion can be founded upon the authenticity of that planisphere. Latrone came to the conclusion that the Denderah zodiac was no older than Nero's reign; but the proof that the Egyptians had a knowledge of astronomy and knew the signs of the zodiac does not depend upon the authenticity of the Denderah planisphere, because other zodiacs can be appealed to, which are undoubtedly of very ancient date. And there is great reason to doubt whether Latrone's conclusion is sound. In the British Museum you will find the signs of the zodiac on ancient stone coffins from Egypt, and also on landmark-stones from Assyria. And these zodiacal signs are not only to be found on Egyptian, but also to some extent upon Central American sculptures. There is, at any rate, a sufficient resemblance in the Mexican figures to show that they cannot be accounted for except by a common tradition and by intercourse between

the peoples. There is one other point in the paper which I fear may tend to weaken what is otherwise a strong array of arguments, and that is what Mr. Mitchell argues in reference to the under-currents of the ocean. Without denying that there may be, or that there are ascertained to be, under-currents in some parts of the ocean, still, so far as I understand the results of recent investigations, I believe they have mostly tended to prove that all is still and quiet at great depths below the surface of the seas. (Cries of "No, no.") I am not disputing that there may be disturbances, sometimes, and in some places; but surely in laying down the Atlantic cable it was found that currents did not exist below the surface, as had been expected. Of course there may be exceptions, such as might be produced by submarine volcanoes and other disturbing causes; and this consideration of such occurrences may, I think, also aid us in the solution of the problem as to the supply of pabulum necessary for the foraminifera of the chalk. In my reply to Professor Huxley I alluded to the due supply of carbonate of lime as a necessity in accounting for the chalk formation; but then I supposed that this might have been supplied to a greater extent at the Creation, when the dry land was first separated from the seas, and also at the time of the Flood, when "the fountains of the great deep were broken up," and when an immense amount of carbonate of lime might probably be thrown into the sea. We ought at any rate to look to some such source, rather than to the quantity that is now being brought into the sea in a settled state of things merely by the present placid flow of the rivers. We ought not to suppose that things have always gone on just as they have been in our own general experience, quietly and systematically; we should rather disregard that experience when we consider even such a series of disturbances as we have heard of during the last few years, especially in the West Indies, and elsewhere in the tropics,—I mean the convulsive tornadoes and cyclones and earthquakes, which may remind us of those greater convulsions whose records are written in history, and the effects of which are surely to be found in many of the geological formations we examine. Take also the case of the Falls of Niagara. It was said by Sir C. Lyell that the wearing away of so many feet of rock by the action of the falls must have consumed a period of 37,000 years or more; but even in our own day it is said there are some extraordinary changes going on in the channel of the river, and probably the Falls of Niagara may sooner or later be perfectly changed in character or even come to an end. I must also here observe that Sir Charles Lyell's theory as to the wearing of the channel by these falls does not account for their beginning at all,—for the rugged dislocation of their channel and formation of the rocks over which they fall; just as Professor Huxley's argument did not account in the least for the formation of the river and the beginning of the deposits of the Nile. Therefore we ought to be very cautious in adopting conclusions based exclusively upon what is taking place now, in our own puny experience, or what may be brought within our own paltry range of observation. (Hear, hear.)

Mr. PARRISON, F.G.S.—There are two great sources of the Nile, one invariable and the other variable,—at least, so Sir Samuel Baker tells us. The

variable one is occasioned by the melting of the snows on the high lands, from which the tributaries of the Nile flow, and, therefore, it is right to say that while it is uncertain as to the quantity of water and the rapidity of the flow, so will it be uncertain as to the quantity of the deposit. Precipitation in the Nile valley in all cases depends upon what is taking place more than a thousand miles off, at its sources, and its supply is peculiarly variable. This disposes at once and for ever of the Nile deposit as a chronometer. (Hear, hear.) The argument has been well disposed of before in the minds of some people, but it seems it has been brought up to do duty again. As regards the geological portion of the paper, while I may say that it is a proper thing to carry the war into the enemy's camp, we ought to do it with great caution, and to carry it on with reserve. Mr. Mitchell has expressed his adhesion to Sir Charles Lyell's view against the successive creation theory. If Sir Charles is not in favour of that view, it is because he wishes to place the time of creation farther from us, because in accordance with his arguments as to geological formation it is a necessity that creation should be further off than most of us put it. But it is not possible to sustain his position. It is not right, I think, to speak of the successive creation doctrine as a theory,—it is a fact. It is a fact that we stand on a deposit of London clay which contains a large marine fauna; and that, not far from where we are, there is, underlying the London clay, an ocean bottom of chalk. There are in some parts evidences of deep seas, in others of shallow seas and banks, and there is not a single fossil in all these deposits like anything we have now, except the foraminifera, and they are small microscopic objects, the examination of which requires a very high power. Therefore it is a fact; and to deny the so-called theory of successive creation is to throw ourselves into the arms of those who are advocates of the Darwinian system. (Cries of "No, no.")

MR. MITCHELL.—I have not taken that view at all: I have guarded myself against it.

MR. PATTISON.—I wished to guard Mr. Mitchell against a view at which we should all be shocked. In our day, if we wish to carry war into the enemy's camp on so well-ascertained a thing as geology, we must be very careful as to the position we take, and ought to be certain that we are correct in our conclusions.

MR. REDDIE.—Sir, the last speaker has laid down the law to us rather absolutely about the certainty of this successive creation theory; and I should not have risen again if he had not done so. But I should like to call the attention of the speaker, as well as of the meeting, to what has been said upon this matter by an authority quite as eminent—namely, Mr. Hamilton, the President of the Geological Society of London. In his annual address for 1865 he stated that "we are daily becoming more convinced that no natural breaks exist between the faunas and the floras of what we are accustomed to call geological periods." (Hear, hear.)

MR. PATTISON.—By no breaks in the creation Mr. Hamilton meant that from the first there has been gradual progress in the formation of animal life.

Mr. REDDIE.—I wished to be brief, or I might have gone further in citing authorities to refute Mr. Pattison's *dicta*, and I will now do so. I shall now quote briefly from what Professor Huxley has said, *ex cathedra*, in the Geological Society as its president. He says, "These seemingly sudden appearances of new genera and species, which we ascribe to a new creation, may be the simple results of migration." This is surely plain enough. Of course Mr. Hamilton and Professor Huxley do not differ from Mr. Pattison as regards any geological facts; but both of them are eminent authorities on geology, and both, it will be observed, reject the "successive creation theory," as to which Mr. Pattison has been so positive. (Hear.)

Mr. MITCHELL.—I have only to reply to one or two things. First, with regard to the Nile deposit, I do feel that there can be no mean rate discovered; and that even if we could discover a mean rate now, we could not be sure that that was the rate that was going on 100 years before. With regard to the suggestion of Mr. Warrington for obtaining a mean rate, I think he must have lost sight of one fact that was stated by Sir Gardiner Wilkinson, and that was, that in one year, not upon the plain of Memphis, but on the extreme verge, and near the desert, and upon masses of rock, where he knew there had been no previous deposit, he found a dried deposit of mud three-eighths of an inch thick. If you were to get any data at all, it would not be much better than the data obtained from that source; and yet it does not follow that because it was three-eighths of an inch thick in one year it was the same thickness in another year. Therefore I think little more can be said, either with regard to the Nile, the Mississippi, or what has been well proved with regard to the Ganges,—no chronology can be obtained from the mud of any of these rivers. Mr. Warrington's criticism about the chalk was not unanticipated. I had guarded myself very carefully. I said, "The possible increase of foraminifera is only practically diminished by their supply of food, and the rate at which their enemies can devour them." Their supply of food depends upon what happens to exist in the water at the time, and it is only now that we are getting some knowledge of the amount of water in the sea, the depths of the ocean, and other phenomena. There was a theory that the deepest parts of the ocean were no deeper than the highest mountains on the land, but that is a fallacy that has since been exploded. Deep-sea soundings had not been made then, but as soon as they were made it was found that there are depths of eight or nine miles. (A voice: "Where? That is the question.") I think you will find that there are doubts with regard to some of the measurements, but there can be no doubt that there have been measurements of depths of seven or eight miles. (A voice: "Sounded?") The depth of seven miles has been sounded since care was taken to get rid of those errors that originally occurred. With regard to the statement brought forward by Mr. Reddie in reference to ocean currents, I may say that the soundings were made on board ship. They used to employ a heavy shot and a very thin line, but the shot was found to present too great a surface, and it met with opposing currents of sufficient strength to carry it away, so that more line was run out than was necessary

to reach the bottom. But that error was afterwards obviated by taking the soundings from a boat, so that the sailors rowed with the current; and in that circumstance you have incidental proof of the existence of great currents in the ocean. I do not think much reliance is to be placed on what we have learnt as to what I may term the exceptional portion of the ocean bottom, where the Atlantic cable has been laid, because it is laid avowedly upon a plateau which has an average depth of only three and a half miles beneath the surface. If you were to go to either side of the plateau, you would come to deep precipices; consequently the plateau presents exceptional phenomena as compared with the other portions of the ocean. But it has been said that because foraminifera have been brought up from that depth with their shells uninjured, that is, therefore, a proof that the bottom of the sea must be extremely quiet. I may explain as regards these soundings that they were originally made by means of cannon-balls attached to lines. But there was scarcely an instance in which the cannon-ball was brought up again, and the only way in which they first got a knowledge of what was at the bottom was by greasing a piece of metal at the end of the line, and so bringing up a small portion of the ooze adhering to it. An American officer afterwards suggested the use of a quill for this purpose, because of the difficulty that the grease caused in identifying the objects under the microscope; and all that we know now of the bottom of the Atlantic has been made known to us through that source. With regard to the food of these foraminifera, when we know the vast amount of ocean we have to deal with, and if we take it only at three and a half miles deep,—just conceive that more than three-quarters of the earth is covered with water, and I think Mr. Warrington will find it will be a very nice problem for him to determine what is the amount of water covering the earth, and how much carbonate of lime it is capable of holding, and we do not know that that proportion may not be increased in the deeper portions of the sea. We know that water at an extreme pressure renders soluble what is insoluble under other circumstances, and we know that the most extraordinary materials and mineral combinations are thrown out by volcanoes; I rather think carbonate of lime forms one portion of those things, and we know that there are volcanoes in the sea. We should remember also that chalk is composed of foraminifera, and also of diatomacea, which are nearly all silicious in their formation. Mr. Pattison has suggested that extreme caution should be shown in carrying the war into the enemy's camp. If he will carefully read my paper, he will see how I guarded myself. I simply stated the facts from the progress of geological science as set forth by Sir Charles Lyell and other men professing to be great geological authorities. I produced evidence to show that the tendency of all we knew, as we increased in a knowledge of the earth's strata and their contents, was to prove that the supposed breaks between what were considered successive creations did not exist, and that animals of a high degree of development are being carried down into strata where they were never expected to be found. The tendency of modern geological science is to carry this further. I stated another thing which did not

suit Sir Charles Lyell to insist upon, but which I did insist upon, and that was that the progress of geology shows that many animals supposed to be extinct are not extinct. Mr. Pattison has spoken of the successive creation theory as not a theory, but a fact. What I maintained was, that before it could be brought forward as an undoubted fact a vast deal more must be known than was known at present. I guarded myself very carefully by using the statement of Sir Charles Lyell that we knew scarcely a tithe of the earth's crust, that not a thousandth part of the strata could come within man's cognisance. We know very little of European geology, and there probably has been no place where geology has been cultivated with such assiduity as in this country, and that cultivation has led to the discovery that the supposed facts upon which the successive creation theory existed can no longer be maintained in their integrity. I carefully guarded myself against Darwinism. I believe that in his new book Mr. Darwin introduces us to a new law which entirely contradicts his development theory. (Hear, hear.) I think, in connection with that matter, that it is a very important point that the creatures which are supposed to form the mass of the chalk are identical with some that are existing now in our own seas ;—and how little do we know of our deep seas ! There was an idea some years ago that we were better acquainted with the seas than we are now. The theory propounded by Forbes, that no living animals could exist below a certain depth, has been disposed of by some very awkward facts that have lately been brought to light. We are progressing day by day in these matters ; we should accept facts only, and be cautioned in the name of science not to adopt theories which will prevent the reception of facts if they contradict our theories. We should hold loosely to our hypotheses and collect more facts, even though it is a long time before those facts are sufficiently numerous to allow us to form any conclusion. (Hear, hear.)

The CHAIRMAN.—I may say, as a sailor, that, having seen the deposits in the Ganges, Irrawady, and Yang-tse-Kiang, very little can be said in favour of a supposed law of deposits. In 1842 there was a Chinese war, and our ships went up to Nankin ; ten years afterwards I went up a passage which at that time, according to the charts, was dry land, yet I had eighteen feet of water. That eighteen feet was deposited elsewhere, and this state of things is constantly going on in long rivers, for a particle of earth can be deposited in them and turned over and over again, perhaps twenty times. The same remark applies to those pieces of pottery that have been noticed ; sometimes they may be high up in the deposit, and after being disturbed they may be found lower down. Mr. Pattison has suggested another point, when he alluded to one of the sources of the Nile being in a tropical region. We know that the mountains there are all pointed ; the soft particles have been washed away in long-past ages, so that there is a smaller quantity deposited than there once was. The deposit, therefore, was in times gone by tenfold greater, I take it, than now. In respect of Mr. Warrington's suggestion, that the only source of supply of carbonate of lime is to be found in the rivers, we know that the waters cover three times as much area as the land,

and if there are three times as many volcanoes opening out into the water as there are above the water, we have here, I should say, a great source of lime supply. Graham's Island has come up half a dozen times ; islands in the Indian Ocean have come up and gone down again, and we have constant springs or geysers, which would all be adding to the quantity. In addition to all this, what do we really know of the condition of things 3,000 or 4,000 years ago ? (Hear, hear.)

The Meeting was then adjourned.

ORDINARY MEETING, MARCH 2ND, 1868.

THE REV. WALTER MITCHELL, M.A., VICE-PRESIDENT, IN THE
CHAIR.

The Minutes of last Meeting were read and confirmed.

The names of the following new members were then announced, viz. :—

Rev. A. Hewlett, D.D. Oxon, Vicar of Astley, near Manchester; E. C. Goody, Esq., The Edge, near Meltham, Huddersfield; Wm. Mewburn, Esq., Wykham Park, Banbury.

It was also stated that the undermentioned book had been presented to the Library, viz. :—

The Authorship of the Practical Electric Telegraph of Great Britain. By the
Rev. T. F. Cooke, M.A. *From the Author.*

The following Paper was then read by the Secretary :—

ON COMPARATIVE PSYCHOLOGY. By E. J. MORSHEAD,
Esq., *Hon. Foreign Sec., Vict. Inst.*

THERE is no doubt that man, as an animal, physiologically considered, is superior to the other members of the animal creation; but the superiority of his physical organization alone is not sufficient to justify us in assigning to him a separate place in Nature. He is subject to the same general laws; he is born; he develops into maturity; he eats, drinks, propagates his species, and dies; and so far he is nothing more or less than an animal.

Now all animals, man included, being subject to more or less similar conditions of nutrition, reproduction, &c., are more or less similar in structure, with such variations in the case of the lower animals as may suit them to fulfil the offices they have to discharge in the natural economy. The causes of sensation afforded by the world which they inhabit in common with ourselves being invariable, their organs of sensation are formed on the same principles as ours; having the same relation to space and matter, they are furnished with suitable organs of locomotion,—and so forth.

It therefore follows, necessarily, that, inasmuch as all animals—at least all vertebrate animals,—while resembling

each other in their general anatomical structure, differ considerably in detail; some of them approximate more closely to the human species than others. Consequently, many naturalists have arranged, or rather have endeavoured to arrange, the lower animals in a gradational series, according to the comparative resemblance of each species to man. Commencing with the anthropoid apes, they have carried this series through the entire brute creation, vertebrate and invertebrate; while some, passing the boundary which separates the animal from the vegetable kingdom, have placed its further extreme on the very confines of organic life. It is not my intention to discuss the anatomical differences between man and brute, but I would remark, in passing, that the theory of structural gradation appears to rest on a very slender foundation. The *Quadruman*a undoubtedly approach the human species more nearly than any of the other mammalia; but in what species of the mammalia are we to look for the next term of the series? If we remove the *Quadruman*a, we remove the keystone of the gradational system, and the rest is a dead level as far as regards the greater part of the mammalia; even the anthropoid apes do not approach man in single file.* Therefore, if the naturalist likes to amuse himself with the Chinese puzzle of arranging the lower animals in a graduated series, there is no great harm done; but the common-sense view of the matter is, that each class of animals having been created for the purpose of discharging special functions, the physical structure of each is regulated, not by the requirements of an imaginary system for which it is difficult even theoretically to assign a valid reason, but by the nature of the duties which each was intended to fulfil, as well as by the nature of the media in which each was intended to live.

This system, resting as it does upon the most insufficient and unsatisfactory evidence, has been made the basis of a still more aerial structure. The Gradationist having marshalled the various species of animated beings in an imposing series, with the anthropoid apes at one end—the other being far away amongst the zoophytes,—the matter is next taken in hand by a more advanced theorist. The Progressionist conceives this graduated series as manifesting evidences of development

* "This much is certain, that each of these anthropoid apes has its peculiar characters by which it approaches man; the chimpanzee, by the cranial and dental structure; the orang, by its cerebral structure; the gorilla, by the structure of the extremities. None of these stands next to man in all points,—the three forms approach man from different sides without reaching him."—Vogt, *Vorlesungen über den Menschen*.

analogous to those presented by an individual member of the animal kingdom in his progress from infancy to maturity. But, however attractive this theory may be as a hypothesis, there is not a single fact to support it *à posteriori*. In spite of all the ingenious reasoning which has been employed by the advocates of the progressive theory, the imposing procession obstinately refuses to move on. The gibbon never develops into an orang; the orang never becomes a chimpanzee; the chimpanzee is never transmuted into a gorilla; and there is no ground for supposing that the gorilla will a thousand years hence resemble the human species any more than he does to-day. It is true that the theory of progressive development has received the sanction of names which stand high in the scientific world; but we must take facts as we find them, and if we are reluctant to run counter to the opinions of such men as Darwin, we should remember that, especially in natural science, a too exclusive study of detail tends to disqualify men for taking comprehensive views, and that, while accepting them as authorities in the statement of scientific facts, we are in no way bound to agree with their conclusions.

There exists a school of modern Anthropologists which is by no means content with this physiological gradation. M. Pouchet, a prominent member of this school, says, in his work on the Plurality of the Human Race, "The intellect of vertebrate animals is identical, as their organism is identical; thus gradually descending, passing through the orang from man himself to all the mammalia." Again, "From animals to man, everything is but a chain of uninterrupted gradation; therefore there is no human kingdom."

It is this important question of the existence or non-existence of a fundamental and essential distinction between the psychology of man and the psychology of the lower animals which will form the subject of the ensuing remarks. I have thought it advisable, on a question which involves some of the most difficult and abstruse problems in metaphysics, to avoid attempts at demonstrative reasoning, and to confine myself to a practical consideration of a few of the arguments which have been put forward on behalf of the theory of intellectual gradation.

In regard to the first of the above extracts from M. Pouchet's work, I would observe that, even if we admit the existence both of a physiological and an intellectual gradation, the theory of their correspondence is not borne out by the evidence of observed facts. In the *Anthropological Review* for the year 1864, three instances, amongst many others, are adduced for the purpose of supporting arguments in favour

of the occasional manifestation of superior intelligence in brutes. One instance is that of a lobster, who was observed to drop a pebble between the shells of an oyster in order to keep them apart while he extracted the edible portion; another is that of an ant, who, finding himself alone in a pot of treacle suspended by a string from the ceiling, climbed up the string, and having rejoined his companions, reconducted them to the treacle by the same route; the third instance is that afforded by the great social intelligence of the bee.

But the bee, and the ant, and the lobster are all without the pale of the Vertebrata. The difference in structure between either of these animals and the Quadrumana is incomparably greater than the difference in point of intellectual value between any one of the above-mentioned instances of sagacity, and the highest manifestations of intelligence that have ever been recorded of the gorilla, or the chimpanzee. Are we not justified, then, in throwing aside the notion that the intelligence of the lower animals varies according to their structural approximation to man? It may be urged that the Quadrumana, who more closely resemble the human species in physical conformation, surpass most other animals in point of intelligence. But much of the intellectual reputation of the monkey is unquestionably due to the possession of a highly developed hand. This hand, with which he was evidently furnished with a view to his habitual residence in trees, enables him to break sticks and throw stones, and to perform other actions which are, as a rule, peculiar to humanity. Combined with his general resemblance to man, the possession of this prehensile member further enables him to manifest in a more human-like manner a quality for which I have been unable to find a more scientific term than "sportiveness;" a quality which is remarkable as having no apparent relation to the ascertained objects of animal existence, but which cannot be regarded as a proof of the mental superiority of the Quadrumana, inasmuch as it is found to a certain extent in nearly all quadrupeds. No one who has observed the gambols of a kitten can doubt but that if it had the hands of a monkey, its buffoonery would be of an equally intellectual order; but when the kitten has grown into a cat, and when, as we may suppose, its intelligence has increased, we no longer find the playfulness which the monkey retains to an advanced age. Moreover this quality is more characteristic of the lower than of the higher Quadrumana.

We may therefore dismiss this hypothesis of the co-ordination of a mental and physical gradation as untenable; and in doing so we clear the road, in regard to the psychological

attributes of an animal, to the view which I have before expressed as to his physiological attributes; viz., that they are proportioned to the necessities of his existence; and we cannot, in attempting to determine the psychical differentia of man and brute, base our reasoning on the analogy of physical structure with any regard to the results of observation.

The usual classification of the mental faculties is that which divides them into Feeling and Intellect. All feelings are instinctive; and the only objection to substituting the word "instinct" in this classification is that instinct may be defined as a tendency to act in a particular manner without reference to the reasoning powers (supposing them to exist), whereas "feeling" is the psychological condition which results in this tendency. Instinct is the only non-intellectual source of action; that is, all actions which do not proceed from the intellect are instinctive actions, whether the immediate cause of such actions is or is not within the scope of the perceptions. It is usually understood in a more limited sense, as implying, according to Paley, "a propensity prior to experience and independent of instruction." The defect of this definition is that, by excluding the element of memory, it necessitates a division of the sources of animal action into blind instinct and intelligence; whereas it is often a matter of great difficulty to decide whether any particular action performed by an animal may be reasonably ascribed to a perception of the consequences of that action. We see a duckling, which has been hatched under a hen, making for the water directly after it has emerged from the egg; and we see a bird startled by the sight of a gun. In the case of the duckling we have an indubitable instance of the operation of blind instinct; but on the other hand, the bird who takes to flight at the sight of the gun does so because it has learnt by experience to associate the appearance of the gun with the impression of danger. In both cases the animal obeys the dictates of its instinct, and we are not warranted in looking on these actions as springing from two different sources. Memory is a distinct quality in itself, and is peculiar neither to intellect nor instinct. It is indispensable, as we well know, to the exercise of the reflective powers, and although, in regard to instinct, we can dispense with it on Sir Isaac Newton's hypothesis of the continual intervention of the Deity, we may ask why, in this case, is not the bird frightened by the gun *before* the destructive properties of that weapon have been practically impressed upon it? The fact is that memory enters very extensively into the operations of instinct, and is extremely useful in

adapting the animal to changed conditions; and the imperfect conception of the latter quality which I have just mentioned as evidenced in Paley's definition, is, perhaps, attributable to the fact that the attention of those philosophers who have sought to define the nature of instinct has been too exclusively monopolized by what, regarded from a human stand-point, is its most remarkable and distinctive feature; viz., its tendency to produce actions which previous experience could not have shown to be expedient; and that, consequently, they have merely differentiated it from intellect, rejecting from their definitions a quality which, as a more careful observation would have taught them, is common to both. Hence the occasional influence of memory in instinctive actions has been generally either ignored or denied; but as long as we entertain the notion that the application of past experience to present circumstances necessarily implies an act of intelligence, so long will our views of comparative psychology be erroneous.

The brute, being destitute of human intelligence, is endowed with a wider range of instinct. Both brute and man experience a tendency to fly from the presence of a stronger antagonist; but the instinct, for instance, displayed by the beaver in the construction of his dam has apparently no analogue in human psychology, because the wants of man in this respect are supplied by his intelligence. So long as they are subjected to the influence of a common instinct, they both behave in a similar manner; but, while the beaver always builds his dam in the same way, an Englishman constructs his house, and frequently the same house, on five or six different architectural principles. We cannot fix on any style of architecture which is peculiar to a variety of the human race in the sense that a particular style of nidification is peculiar to a given species of bird. A Chinaman or an American Indian can build his house like an Englishman if he chooses; but we cannot teach a blackbird to build his nest like a thrush, any more than we can induce a bee to construct his cell after the fashion of wasps. And this unvarying uniformity, by which its operations are characterized, not only constitutes a distinctive feature of instinct as compared with the intellect, but it also furnishes us with the key to its practical objects. The animal, having certain duties to discharge in the natural economy, is furnished with instincts which tend towards the preservation of himself and his species as a means to the fulfilment of those duties. The feelings from which all his actions proceed may be classified under the same head: his fear, his anger, his love, are but the handmaidens

of the grand instinct of self-preservation ; and we could not deprive him of one of these without depriving him of his existence.

Instinct being necessary to, and consequently inseparable from, animal existence, man possesses it in common with the lower animals. In addition to instinct, man also possesses what are termed the *intellectual* faculties.

One of the chief objections which have been urged against the theory that intellect forms a distinctive characteristic of humanity, seems to be founded on the difficulty of comprehending its various manifestations within the limits of a single word. Generally speaking, the question " what is intellect ? " is nothing more or less than a challenge to solve this philosophical problem. The ground has been gone over so often, that it is impossible to make fresh discoveries, and the man who attempts to frame an exhaustive definition of intellect merely expresses his adherence to the view of a particular metaphysician who has preceded him. Does it depend on the power of reflection ? or of comparison ? or of forming abstract ideas ? or is it simply an independent will acting upon highly developed animal faculties ? We may accept either of these definitions singly, or we may accept them all, as describing different phases of the same quality, or we may, on the other hand, confess ourselves unable to form a clear conception of the essential nature of the intellect ; but we know quite enough about it to be able to define it negatively as regards the psychology of the lower animals, just as a geologist may be unable to describe the nature and properties of a given rock, and yet may be perfectly certain that it is not granite. We know that, whatever intellect *is*, it is *not* a higher development of those instinctive feelings which are common to man and brute ; for the passions of man are not different in their nature, nor at all superior, to those of brutes ; while even the advocates of the psychological identity of man and the lower animals allow the immense superiority of man *intellectually* ; and if human intellect and human feeling were different developments of the same quality, there would be intermediate degrees, and the two principles would never be in antagonism to each other.

Nor does there seem to be any good reason for supposing that the intellect is identical in kind with the *natural sagacity* of animals. Whether animals possess this natural sagacity *in addition* to the instinct is not an easy question to answer, at least with any amount of certainty ; but I think that sensation and memory will account for all the phenomena of animal actions. An animal endeavouring to escape from an enemy,

under the influence of fear, and seeing two ways of escape, will select the more feasible one. There is no reason for assuming the exercise of reflective powers here, unless they are more perfect than human reflective powers, which are generally paralyzed in moments of extreme danger: in fact the very rapidity with which an animal acts should preclude this assumption. We know that the impression made by an object on the senses is in many cases involuntarily retained by the memory, and regulates mechanically our future conduct with reference to that object; and we may surely assume the existence of a similar principle in the lower animals. The chamois who finds himself, when followed by the hunter, suddenly confronted by a chasm the width of which slightly exceeds his leaping power, will not attempt to get over it if there is any other way open to him. Are we to suppose that he reasons with himself as to his power of leaping compared with the breadth of the chasm, or that the sight of the chasm impresses on him instantaneously the improbability of his arriving safely on the other side? The great functional difference between this quality and the intellect is that it never rises superior to the instinct as a *source* of action, but is always subordinate to it and employed in carrying out its dictates.

We have next to consider whether anything analogous to the human intellect is to be found in the psychology of the lower animals, or whether all their actions may not be traced to an instinctive source. Mr. Pike, in a paper "On the Sciences of Mind and Language," read two or three years since before the Anthropological Society of London, and pronounced by the President of that Society to have been "conceived in a most liberal spirit," says, "There is not, I believe, any *à priori* reason to suppose that there is a difference of kind between the brute intellect and the human intellect. Whatever difference may exist, must be shown to exist by evidence and not taken for granted; and the evidence which bears upon this point will be the basis of comparative psychology."

But we cannot well bring *à priori* argument to bear on the matter unless we are agreed as to the original object of the creation both of man and brute. If we believe that the object of the existence of brutes is fulfilled by the fact of their existence and by the involuntary discharge of those functions involved in the maintenance of their existence, while man, on the contrary, was created for a higher destiny, there is good *à priori* reason for supposing that he is separated from the brute, as regards his psychical qualities, by a broad line of de-

marcation. We can afford to discuss the question on a *posteriori* grounds; and considering that there exists between man and brute a psychological difference totally disproportionate to the physiological difference, considering that this difference is incomparably greater than that which can be shown to exist between any two samples which may be selected from the brute creation, notwithstanding great variety of structure—considering that the vast majority of the actions performed by an animal are *unquestionably* due to the operation of his instinct—considering that in *language* man possesses an instrument for exchanging ideas with the most degraded members of his species, without that appeal to the instinct which constitutes the only means by which he is able to influence the actions of lower animals—I think it is tolerably evident that Mr. Pike has coolly placed the *onus probandi* on the wrong side.

The arguments which he has put forward in favour of the intellectual similarity of man and brute, are not so irrefutable as he seems to imagine. They consist, to a great extent, of specimens of a style of reasoning which is rather extensively employed by the upholders of the views which he advocates, and which is by no means calculated to dissipate the obscurity in which the subject is involved.

The opinion of a given metaphysician as to the point at issue having been selected, and this opinion having been assumed to constitute a definition intended to express the sum of the intellectual differences between man and brute, it is then demonstrated by extending or perverting the meaning of the terms employed (a process which is rendered comparatively easy by the unavoidable ambiguity of metaphysical language), that the definition embraces psychical phenomena which are indisputably manifested by certain of the lower animals. Thus we find Mr. Pike disposing of Locke's opinion that brutes do not possess *general ideas*, an opinion endorsed by Professor Max Müller. Quoting a remark of Professor Müller's, to the effect that, "when a whale is struck, the whole shoal, though widely dispersed, are instantly made aware of the presence of an enemy," Mr. Pike asks, "What is communicated in this case but a general idea—the idea of danger?" Here we have a characteristic example of the method of ratiocination which I have just described. In making the word "idea" include the simple operation of an object upon the instinct, Mr. Pike invests it with a meaning which, as far as I am aware, has never been attached to it either by Locke or any one else. I have already pointed out the fact that there is an essential difference between Intellect and Instinct, as well as the entire

absence of any proof that an intellectual operation intervenes—in the animal psychology—between the perception of an object and the action resulting from such perception. We may, indeed, regard the whale as revolving within himself the expediency of adopting this or that course of action, and ultimately arriving, by an inconceivably rapid process of reasoning, at the conclusion that it is advisable to make off; but, inasmuch as he always *does* make off under the circumstances, it is obvious that any such process of reasoning is entirely unnecessary, even if we *can* call that a process of reasoning which invariably leads to the same conclusion. Nor does the communication of the “idea” to the other whales argue the possession of a higher order of intelligence. We know that many animals manifest certain feelings by involuntary motions of the body. A dog expresses pleasure by wagging his tail, a cat by the elevation of the same member. We may suppose in like manner that the whale shows his alarm by some movement which is a direct and invariable product of that feeling, and which is readily comprehended by the other whales, as it would be common to all of them if similarly situated.

With the word “general” Mr. Pike has taken a liberty which almost amounts to a pun. As applied to “idea” it means either the distribution of the same idea entertained by one individual amongst several objects, or the distribution of a particular idea of the same object amongst several individuals. Conventional usage sanctions both meanings, but while Locke used the word in the former sense, Mr. Pike interprets it in the latter, in which sense it does not in the smallest degree affect the value of the term “idea” as a psychical phenomenon. That animals have general *impressions*, or, in other words, that the same feelings of fear, anger, &c. are produced by different objects, is beyond all doubt; and our notions of creative wisdom would be seriously modified if we found a hare running away from a dog, and standing still when attacked by a wolf, or flying from both animals and not getting out of the way of a falling tree. But in the case mentioned by Mr. Pike the impression—for it is not an idea—is only general in so far as it is shared by the whales generally.

In another place, speaking of the fact that a parrot has been seen to drop a hollow nut without attempting to crack it, Mr. Pike asserts that the parrot “could only have arrived at the conclusion that the nut was hollow by what philosophers would dignify with the grand title of syllogism.”

Every action, whether of man or brute, *may* be regarded as the result of a syllogistic process. But a syllogism is merely

the artificial imitation of a natural process; it is a logical instrument, contrived for the purpose of demonstrating that which was not previously evident to the perception. It is a proof that man has the power of contemplating the operations of his own mind, a power which the brute does not possess, so far as is shown by any evidence to the contrary; and this self-consciousness is very different from the consciousness of physical individuality with which Mr. Pike endeavours to confuse it. To state the case in other words, the lightness of the nut conveys to the parrot the impression of worthlessness; the necessary factors of the psychological operation which precede the rejection of the nut are nothing more than memory, which is an involuntary agent, and feeling or instinct.

The same method of reasoning has been applied to the argument that *language* constitutes a fundamental distinction between man and brute. The objection may be stated thus: "Language indicates the possession of intelligence; brutes possess a rudimentary language, therefore they possess a rudimentary intelligence." In extending the signification of the term *language* so as to make it comprehend the cries, &c. of brutes, it is evident that we deprive it of its distinctive character as an exponent of thought. It is admitted that this "rudimentary language" is limited to the expression of feeling. But until it is shown that feeling can be developed into thought, it is idle to argue that the vocal expression of feeling can be developed into the vocal expression of thought.

Language, in the proper sense of the word, is not necessarily articulate, as we know from the case of deaf mutes; but whether oral, or written, or expressed by means of the finger alphabet, it is *always* the vehicle of thought, *never* of feeling. For if we eliminate the physical element, the psychical phenomena of language remain unaltered, and to make the organic production of sound a common psychological basis is illogical in the extreme. If any doubt remained on this point, it might be set at rest by an impartial comparison of the nature of the vocal expression of thought and feeling as characteristic of the human psychology. Let us suppose a man undergoing a painful surgical operation. He experiences a strong tendency to cry out. He has no object in doing so; in fact he would avoid it if he could; and it is not until the instinctive tendency has overpowered the opposition of his will that he utters an exclamation of pain. Even then his will does not always yield entirely, and he endeavours to clothe the expressions of pain in articulate language; but if the pain is intensified until the resistance offered by the will is entirely

subdued, his exclamations merge into a purely animal cry—the natural, involuntary, instinctive expression of suffering. The vulgar habit of swearing (erroneously so called) offers another instance of the instinctive tendency to express feeling vocally. When a man swears he does not represent to himself the awful ideas which are generally attached to the words he makes use of. He obeys a natural inclination to vent his anger orally; up to a certain point he employs articulate words drawn from a limited vocabulary which habit has rendered familiar; but it is known that human beings are capable of being enraged to such an extent that even this *quasi* language fails them. In these and other similar instances the expressions of thought and feeling stand in an inverse ratio to each other.

We see, therefore, that, as regards the human psychology, the language of thought and the “language” of feeling differ in their origin, in their nature, and in their objects. And, considering the strong resemblance which exists between the oral expressions of feeling in man and the cries of brutes, we might infer from analogy that these cries are never used for the purpose of conveying information, which is the proper function of language. It is said, however, that “a house-dog barks for the purpose of acquainting his master with the presence of an unseasonable intruder.” It might be argued with equal propriety that the geese in the Roman citadel cackled in order to let its occupants know of the unexpected advent of the Gauls. The fact is that the dog barks because he is alarmed; he barks whether his master is at home or not, and for one instance in which he barks from an ostensible motive, he barks in two without any apparent reason whatever. And whenever we *can* trace his barking to its cause with anything like certainty, we invariably discover that cause—and the same applies to the cries of other animals—in the action of some object upon his feelings.

The argument from the analogy of human cries and the results of observation are further corroborated by a superficial examination of the mutual relation of thought and language. There are two mental operations involved in language, namely, the acceptance of a word, or other conventional sign, as the representative of an idea, and the complete thought or junction of the ideas of substance and activity, expressed by the noun and verb—generally in the indicative mood. Now if we assume the cry of an animal to be uttered with the view of conveying information, we must translate the cry by an entire sentence, passing over the simpler elements of which every sentence is composed, for it has never been shown that animals

are capable of representing simple ideas by conventional signs, either oral or otherwise. Thus the "language" of brutes approaches more nearly to the complex than to the simple phenomena of human speech. Again, the vocal sounds which an animal is able to produce are few in number: hardly, if ever, corresponding to the number of his feelings, they are totally inadequate to represent the objects by which he is surrounded, and still more inadequate to express combinations of the ideas of such objects, together with the requisite modifications of time and space. It may be said that language does not always express a thought or judgment, but a feeling, as in the case of the optative, and perhaps the imperative mood. But these moods are for the most part nothing more than subjunctives with an ellipse of the principal verb. However this may be, we always use these moods for the purpose of informing another that it is our wish or will that such or such a thing should happen or be done, even though the information be conveyed merely with the view of exciting sympathy, and when an optative sentence seems to degenerate into an expression of feeling, we may apply the remarks which I have already made as to the vocal expression of human feeling generally.

Although articulate language is not necessary to the communication of thought, yet verbal language (I am compelled to use this pleonasm owing to the frequent misuse of the term "language") is indispensable. And this conclusion is nowise affected by the fact that a complete thought may be communicated by means of a simple sound or gesture as a conventional symbol; for symbols of this nature only convey the meaning which has been previously attached to them by verbal agreement. Mr. Pike, however, says, "They (the symbols) may be used for the purpose of communication (but not in the form of articulate speech) as in communicating ideas of food, danger, game, &c. Both brutes and men use this kind of language. The cawing of the crow, the whistle of the thief, the look of the lover, may all be classed under this head."

In this classification there seems to be considerable confusion of ideas. Cawing is, I believe, peculiar to rooks (I presume Mr. Pike alludes to rooks); at all events it is natural to them, and not learnt by association with other rooks. If half a dozen rook's eggs could be taken to the antipodes and hatched there, I do not think any one will doubt but that the young rooks would caw as soon as they were old enough. But I am not aware, on the other hand, that whistling is either peculiar or natural to thieves; although such a state of affairs would add greatly to our social comfort, and would be

at the same time of material assistance to detective officers. The only point of resemblance between a caw and a whistle is that they both mean nothing; directly we attach a conventional meaning to a whistle, the resemblance ceases. If one thief whistles to another, he may mean "there is some one coming," or "there is no one coming," or "it is all right," or "it is all wrong," according to previous arrangement. An arrangement of this nature is alluded to by Burns—

"O whistle, and I'll come to you, my lad."

Are we to suppose that the signification of a caw is settled by a preliminary discussion amongst the rooks? or, if not, why is it classed in the same category as a whistle? A symbol conveying a complete thought is a step in advance of language, and there is nothing to support even the probability that a rook possesses the gift of language in the most rudimentary degree. The expression "look of the lover" does not convey a very definite idea, but I think it will be universally agreed that the look, in order to be effectual, must be entirely spontaneous; and if a lover should attempt to express his affection by a voluntary pose of his features, the effect will probably be diametrically opposite to what he intends. Between the look of the lover and the whistle of the thief there are the characteristic differences which I have previously specified; one is involuntary, the other is deliberate; one is natural, the other is conventional; one is the expression of feeling, the other of thought. It is not very clear, therefore, what Mr. Pike means by the statement that "brutes make use of symbols in communicating ideas of food, danger, game, &c." But it is perfectly clear that brutes do *not* express either complete thoughts or simple ideas by means of symbols, and the only proof Mr. Pike adduces to substantiate his opinion, viz., his having "impressed upon a dog the meaning of the general name cat" is worth nothing.

He answers Max Müller's assertion that "brutes neither know nor *name* anything," by a quotation from Milton—

"Knowest thou not
Their language and their ways? They also know,
And reason not contemptibly."

Unfortunately, however, for Milton's infallibility as an authority on the subject of comparative psychology, a writer in the *Anthropological Review*, whose arguments, if they proved anything, would prove that brutes are greatly superior to man both intellectually and morally, quotes, for the purpose of

contradicting it, another passage from Milton, when he speaks of the

"Smile that from reason flows,
To brute denied."

I have not thought it worth while to allude to some interesting remarks which this writer makes as to the moral attributes of dogs. Any one who has occupied himself with the tuition of these animals knows perfectly well that the "moral sense" of a dog is nothing more than the instinctive association of certain actions with personal inconvenience.

With reference to the application of this double system of physical and mental gradation to the human family, I will premise that the evidence which we possess concerning the physiological diversities of mankind does not point to the conclusion that these diversities ever amount to differences of species. Naturalists have not yet decided what species is as regards the lower animals, and perhaps the lower animals themselves are the best judges of the matter. The test which has been received with most favour is hybridity, and this test has been applied to man. As one of the results of the observations which have been made in this direction, it has been asserted that the hybrids of the Negro and Caucasian are not indefinitely fertile *inter se*. Granting this fact, what does it prove? Simply that the constitutional modifications which adapt mankind for a residence in a tropical climate, and those which suit him for a temperate one, do not readily co-exist in the same individual. It is generally allowed that man's physical organization is subject to considerable variation under the influence of the circumstances in which he is placed, and that the tendency of such influence is to adapt him to those circumstances. The Negro has existed for generations under circumstances widely different from those which have modified the physique of the Caucasian; is it, then, matter for wonderment that the Negro-Caucasian hybrid should inherit an organization disqualifying him for existence either under one set of conditions or the other?—a compound, anomalous organization containing within itself the germs of weakness and decay? As yet, however, the evidence bearing on the sterility of these hybrids is inconclusive, and it is absurd to compare the questionable sterility of mulattoes with the invariable sterility of mules and other brute hybrids. Professor Carl Vogt, in his *Lectures on Man*, has endeavoured to prove that the anatomical differences between the Negro and the Caucasian are as great as those which separate * two kinds of *cebus* usually admitted to form

* *Lectures on Man*, p. 211.

distinct species. But at the very outset of his comparison of the structures of the *cebus* he states a fact which entirely invalidates his argument; viz., that, while one *cebus* has five ribless lumbar vertebræ, the other has six; for all the osteological and other differences between various human types put together do not equal in importance the difference of a vertebra. Again, Professor Vogt takes great pains to show that the Negro presents indications of anatomical approximation to a simian type, especially instancing the great length of his hand,—apparently oblivious of the fact that the Australian, who is universally placed *below* the Negro in the gradational system, is, barring a slight abdominal protuberance, as elegantly formed as a European, and that his hand is in the same relative proportion to the rest of his body; there is little doubt that the value of these and other physiological differences has been greatly exaggerated.

The intellectual differences between the various races of mankind are still less strongly marked than the physical. We contrast intellectually the Bushman or the Negro with the highly civilized European, and at the first blush there certainly appears to be an immense disparity. But a very cursory examination is sufficient to show us that the superiority of the European is almost entirely the result of adventitious circumstances. Civilization is not the necessary result of a state of high intellectual development. History does not afford a single example of a nation attaining even a moderate degree of civilization without extraneous assistance. We can trace the stream of modern civilization backwards, until it loses itself on the banks of the Nile. We get our laws from Rome, our taste for literature and the arts from Greece, our religion from Judæa; but does any one imagine that, if Egypt and Greece and Rome and Judæa had never existed, the Celt or the Teuton would have spontaneously developed a civilization equal to that of Europe at the present day?

And although Europe, as a whole, is far more civilized than any nation of antiquity, we do not find that the progress of civilization has been accompanied by a perceptible advance of intellectual power; in fact, it is questionable whether an intellectual comparison with ancient Greece or Rome is not rather to our disadvantage. Furthermore, Europe presents great intellectual uniformity. Within the last six centuries England, Germany, Italy, France, and Spain have produced magnificent literatures; one of the greatest epic poems comes from Portugal; while the Slavonic nations yield to none in literary ability. Considering, then, that Europe was peopled from many different sources, can we doubt that the intel-

lectual activity, the moral refinement, the civilization of Europe is legitimately attributable to the influence of external causes?—can we doubt, looking at the comparative similarity of the conditions to which the different European nations have been subjected, that the very uniformity I have spoken of is a proof that the origin of these intellectual and moral phenomena is *not* to be sought for in the operation of occult psychological principles? I admit that the Negro has been in contact with more civilized nations for some thousands of years without deriving any perceptible benefit therefrom. But it should be taken into consideration that the circumstances under which he has been brought into relation with superior races have not been calculated to foster and develop whatever intellectual qualities he may have originally possessed. His distinctions of rank have been disregarded; high or low, he has always been treated as a slave; he has had no aristocracy of intellect and refinement to look up to and imitate; he could only find models amongst his masters, and he could scarcely be expected to sympathize with *them*. Placed under favourable circumstances, however, the Negro is by no means mentally deficient.

A few years since four youths of pure negro blood were sent to England from Sierra Leone to be educated as surgeons at the expense of the Church Missionary Society. They passed the examination of the Royal College of Surgeons, and were subsequently sent to the West coast of Africa in the capacity of assistant-surgeons to the British army. One of them, by the bye, Dr. Horton, is a man of very considerable intelligence. Now, although the examination of the Royal College of Surgeons may not be a very high intellectual or educational test, it could not be passed by a sort of half-baboon; yet if these gentlemen had been left to run wild in Sierra Leone, they would probably at the present time be neither better nor worse than the rest of their countrymen.

On the other hand, if we turn to our own country, we see in the midst of our civilization thousands of human beings brutal in appearance, in language, in ideas; with little or no sense of morality; frequently only superior to the Andaman Islanders in as far as they are restrained by the fear of punishment. Yet these men are of the same blood as ourselves; they are continually exposed to the ameliorating influence and example of those immediately above them, and their ranks are being constantly recruited by those who have been unfortunate in a higher station of life. Perceiving, therefore, this moral and intellectual degradation around us, recognizing the causes by which it is produced, knowing that these causes have been in

unrestrained operation amongst savage peoples from time immemorial, it is surely irrational in the last degree to adduce the similarity of result as a proof that these peoples are endowed with intellectual faculties radically distinct from our own.

The inference deducible from the foregoing considerations is so obvious that we cannot afford to sacrifice it to the exigencies of the gradational system. Great as are the intellectual differences which distinguish the various races of mankind, they are not to be classed with the difference which separates him from the brute, and it is difficult to understand the affectation which pretends to be "unable to discriminate between the psychical phenomena of a Bushman and a chimpanzee." The Veddah who counts as far as five, can count as far as fifty; the Malay,* who "has no general term for tree," has hundreds of general terms which require for their conception an equal or greater degree of intellectual power. The Veddah whose faculties are absorbed in a continued struggle for existence may have first neglected and then forgotten the existence of a God, just as the Andaman Islander may have forgotten the use of fire; but there is one characteristic of humanity which is never found wanting—I mean a recognition of the distinction between good and evil. The good may not be identical with our good, nor the evil with our evil; the standard of morality may be higher in one nation and lower in another, or it may vary on the same plane, but it is always there.

We see the animal furnished with instincts the objects of which are at once found in the necessities of his existence. We see man likewise endowed with instincts without which he would have been extinct long ago. We see him in addition possessed of a quality essentially distinct from the instinct and entirely unnecessary to the preservation of his existence, a quality which "presides over his actions and enables him to follow out the end he proposes to himself." To what purpose man was gifted with the intellectual powers, the free will, and the moral responsibility thence flowing, is a question which is beyond the scope of philosophical investigation. There is a theory as old as the hills, and perhaps older, but which with those who confound novelty with progress, and the advance of human knowledge with the advance of the human mind, has fallen into disrepute apparently because it is old—

"Lume v' è dato a ben ed a malizia."

* *Anthropological Review*, 1864. This, however, is incorrect. The Malay has a general term for tree.

The CHAIRMAN.—I am sure you will all cordially concur in a vote of thanks to Mr. Morshead for his valuable paper. (Hear, hear.) I am sorry he is unable to be present ; and now I invite discussion upon the paper.

Rev. C. A. Row.—I do not rise for the purpose of impugning the general statements or results which Mr. Morshead has embodied in his paper, but I own I do think that some portions of his argument have not been properly sustained. If I understand him rightly, Mr. Morshead considers that all the actions of brutes may be accounted for by the use of the terms instinct, memory, and natural sagacity. Now, I confess I am unable to understand what natural sagacity means, unless it be some exertion of what we call intellect. Mr. Morshead denies that brutes possess intellect, although he admits his inability to define what we mean by intellect. Now, I do not mean to say that an animal has the same intellect, or anything like the same intellect, as a man possesses, but I do think that brutes possess an intelligence which produces, though of course in a much less degree, results something like those produced by the intellect of man. If I see in brutes certain results produced, which, had they been in us, we should say resulted from man's intellect, I think I have ground for inferring that there is a certain amount of intellect, though, of course, of a much lower kind than man's, at the bottom of those results ; and I cannot think what natural sagacity is in brutes, unless it is some sort of intellectual power. Mr. Morshead assumes that everything done by animals is the result of instinct or memory, or both combined. Now, I cannot see what substantial result can be accomplished by memory, unless we give it the aid of some kind of intellectual power. Take the instance, which Mr. Morshead has quoted, of a bird "taking to flight at the sight of a gun, because it has learnt by experience to associate the appearance of the gun with the impression of danger." Now, I have often held a stick up towards a bird, and it has not been in the least alarmed ; but I have no doubt that if I had held up a gun instead, it would have made off at once. Is that the result of instinct or of memory ? or is it the result of some reflective intellectual power ? I cannot understand how instinct alone could make a bird apprehend that there is danger in a gun, and none at all in a stick. I know that a great many of the anecdotes one reads of animals are not altogether reliable, but I will pledge my word for the truth of one or two which I am about to mention. I formerly kept bees for some time. Now, any one who is at all acquainted with the habits of bees is aware that the bee constructs a cell according to the perfect principles of mathematics, and it is of course impossible to suppose that that is the result of anything but instinct. But, under circumstances of necessity, it is well known that the bee is capable of varying the size, form, and build of its cells, and that, I think, goes some way to show that the bee possesses some measure of intellectual power, though not of the same kind as, and inferior to, man's intellect. In a village where I kept bees at one time, a number of other persons also kept bees, and a hive full of comb was kept in a house in my garden. In swarming time a great number of the neighbouring bees came

into my garden, and a day or two afterwards a "swarm" took place in the village, and came down into my garden and settled in my hive. Now, that is a very important fact. Every one knows that bees, in swarming, always follow the queen bee; but their tendency is to "settle" as soon as they can. Now, what took place here? They did not settle near the spot where the swarm took place, but sent out a number of scouts, who came into my garden and found the best possible spot for settling—my empty hive. It should be borne in mind that the queen bee never leaves home except once in swarming time, and once in early life. These scouts, then, must have had some means of communicating with her concerning the hive they had found, and informing her that there was a suitable habitation for her and for them within a seven minutes' distance. The queen bee, necessarily ignorant of the road, must have been conducted to the spot by the scouts. It is impossible to ascribe all these things to the operation of mere instinct, and, as to memory, that is altogether out of the question, as the queen bee could have had no memory upon the subject at all. I have also kept dogs; and here is a remarkable occurrence which, I believe, shows conclusively that a dog has some higher power to guide him than that of mere instinct. One of my dogs was a setter, which became an expert and inveterate poacher; and our man had a large sheep-dog, which was a very fleet runner. The setter used to persuade the sheep-dog to go out with him on his predatory excursions, and there they would "hunt in couples," the one starting, and the other catching the game. I have taken meat to the setter at the time when he was usually fed, and I have found that, instead of eating it all himself, he has taken part of the meat to the sheep-dog, and then, after bribing him in that way, and after a little play between them, they have gone off together hunting for game. Now, if I were to persuade any one to do an act which he did not wish to do, I think you will admit that I should be exercising some rational power. And that is precisely what used to occur between the two dogs. The setter used himself to eat less than he was allowed, and give the remainder to the sheep-dog, in order to induce him to become an accomplice in the commission of an illegal and improper act. Another instance of a dog exercising reasoning power was at Plymouth Harbour. The harbour is three parts of a mile across, and between the Devonshire and Cornwall sides a steam bridge ferries passengers across. I have seen the dog I refer to come down to the water's edge on one side just as the steam bridge had started for the other. And what used the animal to do? He knew that in half an hour the steam bridge would be back again, ready for a fresh journey; and the dog would wait quietly on the beach until the steam bridge came back, and it would then jump on board. I maintain that such a course on the part of a man would plainly be the result of a process of induction, and I think we have no right to assume that the dog was not capable of going through some such mental process himself. There are various other instances which I might give you of animals, and especially of bees, which I believe show the possession of some intellectual power, though of course I am far from contending that that power is anything like the intellect of man. Animals, I think, possess ideas,

though the number of their ideas is very limited indeed ; and they are capable of exercising a comparison of such ideas as they do have. I understand Mr. Morshead to state that a dog only barks under the influence of fear. I doubt that very much ; but at any rate, whether that is true or not, I know that a dog barks sometimes, and if it fails in arousing the attention of a person near, whose attention it wishes to arouse, it will go to him and endeavour to attract his attention in some other way, as though saying, "Why don't you come and see what is the matter?" Mind, I am not controverting the general conclusions of Mr. Morshead : I only wish it to be understood that I should arrive at those conclusions on grounds considerably different from his. One of the great distinctions between man and the lower animals is found in the possession by man of the moral faculties. I do not mean to say that a dog, however, is entirely void of all moral ideas, as Mr. Morshead has asserted. I am not prepared to say that, because I remember a dog which I had for many years, and when I was going out, if I said, "Dash, you must not come"—not at all in an angry tone—the dog, which at other times was anxious to follow me, would at once stop and remain at home. I do not mean to say that Dash understood the language I used, but he had some understanding which, to my mind, was something more than mere instinct. I think the dog has unquestionably a sense of affection to its master, and that certainly has some remote analogy to the moral qualities. A great many of the brutes exercise a kind of morality which, if all men only possessed as much, would make us all better and happier than we are. The great distinction between man and the lower animals is, however, the large absence on the part of brutes of moral ideas, and, above all, in the absence of spiritual ideas ; and in those two branches I include a large range of ideality. Of course I am prepared to admit at once that I do not think brutes can reason syllogistically, but I am thoroughly satisfied that human beings never reason syllogistically either. No doubt we can reduce our reasoning into the syllogistic form ; but, practically, we never do reason in that way. We pass with great rapidity over a vast number of links in the chain of our reasoning. There is another point in Mr. Morshead's paper which caught my attention. He spoke of "the chamois who finds himself, when followed by the hunter, suddenly confronted by a chasm, the width of which slightly exceeds his leaping power, and will not attempt to get over it if there is any other way open to him ;" and he thinks, because the animal makes its choice instantly, that therefore it is impossible it should have been influenced by any reasoning power. Now, I apprehend that some of the highest processes of reasoning and of intellect are gone through instantaneously. In my own case, I have often found, when I have been engaged in literary composition, that many of the things I have done quickest have been the best I have ever done ; and surely such work belongs to the highest class of intellectual work. A vast number of our intellectual actions are accomplished more rapidly than we can ever analyze. Because I cannot analyze the process by which I speak to you now, does it therefore follow that that process is not highly intellectual ? I do not think because a

brute acts very suddenly, that that is to be taken as a proof that it acts only by instinct and does not give some consideration to its acts.

Professor MACDONALD.—I have listened with great interest to Mr. Morshead's paper, but I must say I object to his opening sentence:—

"There is no doubt that man, as an animal, physiologically considered, is superior to the other members of the animal creation ; but the superiority of his physical organization alone is not sufficient to justify us in assigning to him a separate place in nature."

I consider that man's physical and psychical qualities place him naturally as far above vertebrate animals as vertebrate animals are placed above the invertebrate. Man is an animal, certainly, in his physical constitution, but in no way can he be naturally included within the class of brute animals. He is not merely superior to them, but he belongs to a higher class altogether. His spiritual and intellectual qualities place him far above them. Man is the only animal—supposing you are reluctant to allow me to remove him from the class—man is the only animal capable of apprehending infinity : he is the only animal capable of apprehending a God. Races of men may differ, some of them going down to a very low level of intelligence ; but whatever differences you may find among them in regard to the possession of the high qualities of humanity, yet still you will always find that even the lowest races of mankind are infinitely superior to even the highest creature among the inferior animals. There is one great distinctive mark of power which man possesses and which the lower animals have not—I mean the ability to construct offensive and defensive weapons. The lower animals have no power of making such weapons. They may be able to take up a stone or a stick, or some other missile lying in their way, and throw it out at anybody near them whom they are afraid of or wish to injure, or they may attack him with their offensive organs ; but they cannot construct an engine either to protect themselves or to be aggressive to any one who approaches them. That I conceive to be a strong reason for placing man in a kingdom separate from animals altogether, and therefore I object to the assertion that man is not entitled to "a separate place in nature." Mr. Morshead goes on to say,—

"He is subject to the same general laws ; he is born ; he develops into maturity ; he eats, drinks, propagates his species, and dies ; and so far he is nothing more or less than an animal."

Why, the same thing might be said of a prawn, of an insect, and even of still lower members of the animal kingdom ! They are born ; they develop into maturity ; they eat and drink ; they propagate their species ; and they die. But all that does not make them equal to man. Then Mr. Morshead says, speaking of "all animals, man included":—

"The causes of sensation afforded by the world which they inhabit in common with ourselves being invariable, their organs of sensation are formed on the same principles as ours ; having the same relation to space and matter, they are furnished with suitable organs of locomotion,—and so forth."

So far as the organs of locomotion are concerned, the inferior animals are, no doubt, furnished with such organs; but that does not prove that their organs of sensation are the same as man's, either in quality or in extent. I suppose he does not mean to say that they are the same in extent and in kind—

Captain FISHBOURNÉ.—He argues rather the other way, I think.

The CHAIRMAN.—His view is, that man to a certain extent enjoys these things in common with the inferior animals. Man's eye, for instance, is a valuable organ; but it only belongs to the same class as that of the eagle.

Professor MACDONALD.—There is something in favour of the general reasoning, that animals indicate a certain amount of intelligence or natural sagacity, and that it is difficult to deny them some amount of reasoning power. Mr. Morshead has mentioned the cawing of the rook. Now, it is a very singular thing that rooks in the country are perfectly aware when it is Sunday; and that on that particular day of the week you will find them resting quietly on the boughs of the trees within a very short distance of you, or walking about perfectly fearless at your approach—

Mr. REDDIE.—I believe that is confined to Scotch rooks, is it not? (Laughter.)

Professor MACDONALD.—You know a Scotchman is quite entitled to explain his experience and the observations made by his countrymen. (Laughter.)

The CHAIRMAN.—I am afraid the rooks are not quite so good in this southern quarter of the country. (Laughter.)

Professor MACDONALD.—Probably you have not here the same respectful observance of the Sabbath. (Laughter.) With regard to the indications of intelligence which dogs display, there is really no end to the cases that might be quoted. My brother-in-law had two small favourite dogs, and they also knew when it was Sunday—

The CHAIRMAN.—I think dogs, in a well-regulated family, generally do know when it is Sunday. (Hear, hear.)

Professor MACDONALD.—My brother-in-law could never leave the house on any weekday but the dogs were out before him; but on Sundays they merely accompanied him to the door and there stopped, as though to bid him adieu. It has been said that the lower animals are not capable of syllogistic reasoning, and for their own sakes I think it is a great blessing for them that they are not. (Laughter.) I quite agree with Mr. Row, that, though our reasoning may be reduced to syllogisms, we do not practically reason syllogistically. Something has been said as to the way in which bees build their cells. Now, it is very well known that some of the best-formed ships have been built by people who knew nothing about mathematics, but who constructed them upon sound mathematical principles, and those ships have been most successful in their sailing qualities; while others, built in the royal dockyards of the country, under all the advantages of skilful mathematical supervision and with every engineering advantage, are not always so

successful. As to the different forms which have been found in the cells of bees, the variation in shape is generally caused by some interference with or obstacle in the hive itself; and if such a variation merely results from want of room in some particular direction, that is only an instance of architectural necessity or compulsion—

The CHAIRMAN.—It is rather more than that, I think.

Professor MACDONALD.—With regard to the endeavour to find the difference between instinct and intellect—where the one ends and the other begins, which is a very narrow point indeed—I am afraid it is impossible to draw a strict line of demarcation. They are as difficult to separate precisely as heat and cold. We may form certain boundaries and make definitions, but I do not think they are altogether tenable when made—

The CHAIRMAN.—You consider that the one merges by such insensible gradations into the other, that it is hard to mark the distinction between the two.

Professor MACDONALD.—I do. I may say, before sitting down, that I am very well pleased with the general conclusions of Mr. Morshead on the subject, except in the assumption that man is nothing more than an animal.

Captain FISHBOURNE.—I do not think Mr. Row has at all succeeded in making out the case which he put before us; and I may add that the instances he has quoted are not in point, to my mind. You cannot arrive at a fair conclusion so long as you consider the actions of a dog or of any other animal in the direction of its instincts. It is only when you consider its acts in opposition to its instincts that you can arrive at any results. Here is a case which shows how blind an animal's instincts are. I quote from *Creation's Testimony to its God*, by the Rev. Thomas Ragg. He says,—

“The beaver likewise, when its building season arrives, unites with its fellows in the construction of a dam across the chosen river, and of a number of adjacent habitations, carrying on its operations in the exact manner in which the highest intelligence would have directed. Yet the beaver will exhibit its building instinct even in captivity, and in circumstances in which its labour could be of no possible use; thus showing that its operations are directed by a blind instinct inspired by an intelligence other than its own. A curious instance of this is related by Dr. Carpenter. One, half domesticated, in the possession of Mr. Broderip, began to build as soon as it was let out of its cage and materials placed in its way. Even when it was half grown it would drag along a large sweeping-brush or warming-pan, grasping the handle with its teeth, so that the load came over its shoulders, and would endeavour to lay this with other materials in the mode employed by the beaver when in a state of nature. The long and large materials were always taken first, and two of the longest were generally laid crosswise, with one of the ends of each touching the wall and the other ends projecting out into the room. The area formed by the cross brushes and the wall he would fill up with hand-brushes, rush baskets, books, boots, sticks, clothes, dried turf, or anything portable. As the work grew high, he supported himself upon his tail, which propped him up admirably, and he would often, after laying on one of his building materials, sit up over against it, appearing to consider his work.”

I suppose that was in intellectual contemplation. (Laughter.)

"This pause was sometimes followed by changing the position of the materials, and sometimes it was left in its place. After he had piled up his material in one part of the room, for he generally chose the same place, he proceeded to wall up the space between the feet of a chest of drawers, which stood at a little distance from it, high enough on its legs to make the bottom a roof for him, using for this purpose dried turf and sticks, which he laid very even, and filling up the interstices with bits of coal, hay, cloth, or anything he could pick up. This last place he seemed to appropriate for his dwelling; the former work seemed intended for a dam. When he had walled up the space between the feet of the chest of drawers, he proceeded to carry in sticks, clothes, hay, cotton, &c., and to make a nest; and when he had done he would sit up under the drawers and comb himself with his hind feet."

Here is a clear and unmistakable instance of blind instinct, and I have no hesitation in saying that any of these facts, any of the cases mentioned by Mr. Row for instance, can be explained on the principle stated in the paper. Animals, I believe, have an utter incapacity for reasoning. To a certain extent animals may be taught certain things, but the moment you change the circumstances under which they have been instructed they fail utterly to make any allowance for that change of circumstances. To take another example, the author of this book, after speaking of rabbits and foxes, says,—

"Yet it is evident they do not know the character of the work they are engaged in, for experience could not have taught them. The butterfly or moth which deposits its eggs in the exact spot where the future grub will find its most suitable nourishment cannot know that it will be found when they want it, where most frequently it does not exist at the time the germ is laid there; for the flesh-fly, deceived by its sense of smelling, will lay its eggs in the petals of the carrion flower, whose odour so closely resembles that of tainted meat."

Here again is a total absence of reason. It is a case of mere instinct. The smell leads the insect to deposit its eggs in a certain place utterly unfit to receive them, and those eggs are therefore laid in a place completely unsuited to the purpose in view. Then, speaking of hens, the author goes on to say,—

"And yet are they endowed by instinct with some impression which teaches them to provide for the *natural* result; for a young hen of mine which made her first nest, a stray one, under a heap of coals, when the eggs were discovered and taken away during her absence, after she had sat upon them for a day or two, wandered about the coals calling the chickens."

Here again we have a specimen of defective observation and reasoning. The hen calls her chickens when there are really no chickens to call. The author continues,—

"Our domestic poultry, indeed, long as they have been under the tuition of man, will, to a close observer, exhibit, especially in early life, the stubbornness of natural instinct. Accustomed in their wild state to roost upon the branches of trees, they usually seek the highest roosting-place they can attain, even though a much more comfortable spot is provided for them below."

And the author mentions a case in which great care was taken to accommodate the chickens, but all to no purpose. A warm nest was provided for

them in a good situation low down near the ground ; but the fowls would persist in roosting in a high place, and though this comfortable spot was prepared for them, they neglected it and roosted in another place high up and open to the air, where they perched daily in the cold, although it is notorious that fowls like warmth, and that it is absolutely essential for them. The author shortly afterwards goes on to say,—

"Thus it is, too, with unreasoning creatures, in regard to pairing, procreation, and every other instinctive proceeding. They *appear* to exercise mental power and discrimination, but that mental power and discrimination are not their own ; for, with regard to all alike, it may be asserted that education has not taught, and experience has not convinced. Their operations, then, give evidence on every hand that the power which organized them, implanted in each organization such ideas as were necessary for its being, its happiness, and the preservation of its tribe. Their mechanism, whatever they construct, is more perfect in its way than man's. Yet, as far as the creatures themselves are concerned, it displays no power of contrivance and design. Perfect in itself for the purposes for which it was intended, and often surpassingly beautiful, it yet exhibits no acquaintance with the principles of symmetry or beauty in its constructor, because that constructor only blindly carries out one implanted idea. Each displays what *appears* to be mental power in one particular manner only, each being only enabled to execute one design, though he executes that one with a perfection to which man cannot attain. Thus instinct is 'involuntary,' and not governed by *will*. Its limits are fixed, and whatever may be the condition of the animal, it cannot travel out of them. From age to age, under every variety of circumstances, it preserves the same beaten path, and never either retrogrades or advances. It is an unerring guide, but it is a blind one."

Then here is a very interesting case from Blumenbach with regard to an animal which we are told is in some degree related to man :—

"Thus Blumenbach's ape, having got hold of a large work on insects, turned over the leaves with a very studious air, but he pinched out all the painted beetles and ate them, mistaking the pictures for real insects. His taste and touch did not serve to detect the deception of his eye, while under the excitement of appetite produced by the image of a thing which he naturally relished."

I think this really contains the whole point which is involved. Unless you take the animal under circumstances which do not involve the operation of his instinctive habits, unless you call upon him to perform some operations which are not in the direct ordinary line of his instinct, you cannot really estimate whether he is influenced in what he is doing by reason or not. I, therefore, do not think that the cases mentioned by Mr. Bow bear upon the point at all. One of the great distinctions between man and the lower animals is language. Man has the power, which no animal possesses, of conveying an embodiment of his ideas by symbols to other men. That distinction really involves intellect to my mind, and short of that it seems to me that there is no intellect at all. (Hear, hear.)

MR. REDDIE.—It is perhaps unfortunate that Mr. Morshead's language has not been more definite, but I do not think he is quite open to some of the criticisms which have been passed upon him. Although he has used the phrases "intellect" and "instinct," and put them in antithesis, I don't think

he meant by intellect what Mr. Row considered he did. Indeed, it seems to me impossible that he could have done so, and I do not think that what Mr. Row has defined as intellect is exactly intellect after all. With regard, for instance, to the case of the chamois judging of the breadth of a chasm, my impression is that the chamois judges probably just as a man would. A man would judge of such a matter on the spur of the moment, entirely by that sort of instinct which he and the chamois both have, and there would be no intellectual process in the case at all. There is no doubt at all in regard to the fact stated by Professor MacDonald as to many admirable ships having been laid down by ship-architects who have been without that mathematical training which is considered so essential in naval architecture. The lines of those ships have been devised in the architect's eye by a kind of instinct, and very remarkable results have been produced. I know that the distinguished mathematician Professor Oliver Byrne, a member of this Institute, was associated with a man in America who turned out some admirable ships by rule of thumb, and who could not design from calculations. Professor Byrne had to give him the mathematical elements in the construction of those ships which he thus devised entirely by a kind of instinct. It has been said that a dog barks when he is afraid. Now, on that point I have arrived at a different conclusion, and my impression is that a dog barks most when he is least afraid! I have often seen a dog barking at a man who was strange to it; but if, under such circumstances, you show a good front, the dog leaves off barking, turns away, and, in all probability, howls. You convert his first impressions with regard to you into a positive panic. On the point that memory influences animals with regard to their instincts there can be no doubt whatever. It is unquestionable that when men first go to an uninhabited island, the birds and animals, unused to the presence of human beings among them, allow themselves to be approached without the slightest fear, and the habit which they acquire of making off at the approach of man seems to be the result of experience, or of an inherited memory becoming an instinct. They certainly do not always wait to ascertain the destructive properties of the weapons used against them; for if birds did not fly away from a gun *until* they were shot, they would never have the chance of flying away at all. (Laughter.) I cannot agree with Mr. Row on another point. His experience and mine differ with regard to the pointing of a stick at a bird; for I have often seen a whole colony of crows and other birds put to flight by having an umbrella or a stick levelled at them. I have, however, heard before what Mr. Row has stated, that birds will fly away from a gun, but not from a stick; and I have heard this explanation given—that the birds by experience have learnt the smell of gunpowder, and the danger to them with which it is associated. But, to leave these small details, which do not invalidate the general arguments of our author, I do not think Mr. Morshead has given us a sufficient indication or definition of what is the distinctive difference between that kind of intellectual power which is called instinct, and that other kind of intellectual power which we call intellect alone. I suppose that Mr. Morshead's view is, that instinct is a kind of

very rough reasoning—a kind of reasoning the processes of which we cannot follow, but which is certainly intellectual so far as it goes. Certainly the paper before us does not deny that view in strictness of language, because Mr. Morshead speaks of the distinction between the psychology of man and the psychology of the lower animals being the classification of two very different mental operations. One of the quotations read by Captain Fishbourne very nearly hit the matter on the head, but did not quite work it out. An animal has its instincts limited to a very small circle of actions; and it is of little consequence to us whether or not there is a kind of reasoning associated with those instinctive operations, if we establish the fact that those operations do not travel beyond a certain limit. You find, for instance, that a bee performs marvellous things, and so does the spider; but you never see the bee attempting anything like the work of the spider, or the spider attempting anything like the work of the bee. The bee does marvellous work in its own line, far transcending the work of the human intellect in a similar direction; thus furnishing abundant testimony to the existence of that Supreme Intellect which has furnished it with the means of working so well. Take any bird you like—say a blackbird or a thrush—and you find that each builds its nest in a way peculiar to itself. Or take a beaver, and you find that it has a wonderful power in its own particular line of work which man does not possess, because man has to acquire all his arts gradually, but the animals are born with theirs. We possess that most perfect and complete gift of an intellect, which the animal has not; and yet the lower animals can perform work which it is beyond our power to imitate or to analyze. This subject might further be followed out, and we might well have another very interesting paper upon it. I recollect, when a paper by Mr. Pike was discussed in the Anthropological Society, that Mr. Wallace mentioned the case of a fish having a piece of pork presented to it over the side of a boat; and he proceeded to say that that fish went to the other fishes, and communicated to them the intelligence that they also might possibly be fed with pork if they followed the boat. (Laughter.) But it was ingeniously urged in reply, that the first fish, after swallowing the pork, had returned to its companions, and that they had been informed of what it had eaten simply by the smell of the pork, and that so in turn they made their way to the boat. And now I should like for a moment to defend the commencement of Mr. Morshead's paper, the accuracy of which has been impugned by Professor MacDonald, because I think it is very important in such papers to have the beginning well and accurately laid down. Mr. Morshead states that, *physically*, man, although superior to the lower animals, is neither more nor less than an animal; and in controverting that I think Professor MacDonald is both wrong and unorthodox in his views, because Solomon has told us that there are certain things which we ought to consider for the express purpose of knowing that we are but animals ourselves. Shakespeare, again, speaks of man as "a worm—a god," putting the phrase in the mouth of Hamlet; and that corresponds with the expression of the patriarch Job, who also calls man a worm. In regard to all those things

which belong merely to our "physical organization," or bodies, we are certainly no other than animals; and I would go further, and say that, in some respects, we are no better even than the invertebrate animals. The invertebrate animals are as good as we in regard to their eating and drinking, living and dying; but that does not invalidate the superiority of man in other respects. Of course I am not prepared to agree with Professor MacDonald on another point. I cannot agree, or at least I do not think it is an argument which we can at all use, that man is the only animal having any idea of infinity. We do not know, and have no means of knowing, whether the inferior animals have any idea of infinity or not; and I am not very sure, on the other hand, whether men generally have any full idea of it either. That case quoted by Captain Fishbourne of the monkey which pinched the beetles out of the book and ate them shows how very poor the animal intellect is, and there are better instances even than that. Gorillas in the African forests will watch the traveller as he passes through them, and see him sit at the fire he has made, and warm himself; and after he has passed on, they will also sit round the fire, stretch out their legs, and warm themselves like the man; but they have not the common sense—and that is really the exact expression for what they want—they have not the common sense to put on a single stick to keep the fire alive! That alone shows what an immense intellectual difference there is between a man and a brute. We cannot deny, and I do not think Mr. Morshead means to deny, that there is a certain amount of ratiocinative power in the animal; but there is a difficulty about Mr. Morshead's definition, perhaps, which laid him open to some of the criticisms of Mr. Row.

Rev. S. WAINWRIGHT.—I think Mr. Reddie has shown—what, indeed, is self-evident, and what I am prepared to maintain, in the face of the *Saturday Review*, and of the whole school of those who oppose us—that we cannot possibly have a true solution of the matters which surround this subject on every side, except by adopting that which, until it is put out of court by a positive refutation, has an unanswerable claim to be considered the absolute truth. Mr. Morshead has pointed out that, viewed on one side of his being, man is only an animal; but there is another side of his being, in respect of which he is not an animal; and the whole man is that complete being so fearfully and wonderfully made that there is plenty of room for him to wander up and down within himself, and in himself be lost. I cannot agree with the view held by Mr. Row, that animals have an intellect of the same kind as, and merely differing in degree from, that of man. The difference is one not only of extent and degree, but of kind. The intellectual power of the animal, if you like to call it so, is *sui generis*: it has nothing in common with the human intellect. Mr. Row linked several of his facts together with a copula very much in favour with Mr. Darwin and others of his school when they declare that so-and-so *must* be so-and-so, and *must* have such-and-such an effect. Though I am a clergyman, I confess I am of a somewhat sceptical turn of mind when I come across that phrase; and, until I have seen a reason for it, I never admit a "must." I am bound to say

that I have not seen the reason for it here. Mr. Row gave us one or two anecdotes of dogs, but it appeared to me that every one of the instances he gave us could be satisfactorily accounted for by the simple association of ideas.

Mr. Row.—Surely that is intellectual?

Mr. WAINWRIGHT.—That association of ideas is sufficiently dealt with by Mr. Morshead in the passage which follows the reference to the parrot declining to crack a hollow nut. He altogether repudiates the idea of going by syllogistic theses. He says,—

“Every action, whether of man or of brute, *may* be regarded as the result of a syllogistic process. But a syllogism is merely the artificial imitation of a natural process; it is a logical instrument, contrived for the purpose of demonstrating that which was not previously evident to the perception. It is a proof that man has the power of contemplating the operations of his own mind, a power which the brute does not possess, so far as is shown by any evidence to the contrary; and this self-consciousness is very different from the consciousness of physical individuality with which Mr. Pike endeavours to confuse it. To state the case in other words, the lightness of the nut conveys to the parrot the impression of worthlessness; the necessary factors of the psychological operation which precede the rejection of the nut are nothing more than memory, which is an involuntary agent, and feeling or instinct.”

An expression used by Captain Fishbourne gives us the key to the whole matter. He has spoken of the “blind instinct” of the animal. We find an authentic statement, the evidence of which has never yet been put out of court, and that statement tells us that the difference between the animal called man and the other animals is in—call it spirit if you will—in the spirit, which has nothing earthly about it, or naturally sinking—that spirit of man which goeth upward. There is in man the breath of the Almighty, which gives him understanding; and that I take to be the only possible solution of the matter. Mr. Row has given us anecdotes of dogs. Now, I have seen performing birds, which did most wonderful things; but surely Mr. Row would not say that they were guided in what they did by reason. They were taught to climb up sticks, to draw a small carriage about, and to go through a variety of performances. I have also seen a performing horse—

Mr. REDDIE.—And there are even performing fleas, you know. (Laughter.)

Mr. WAINWRIGHT.—Yes, but I never watched them, I am happy to say. The performing horse I saw do a variety of things, and it was made to indicate the day of the week, and do other feats of that description; but in all that it did, it obeyed some signal from its master, either in what he did or in the inflection of his voice when he spoke. The whole performance, so far as the horse was concerned, was simply and purely the result of the association of ideas—

The CHAIRMAN.—But if you grant the association of ideas, does not that imply intelligence? Can you have the association of ideas without intelligence?

Mr. WAINWRIGHT.—Well, I have not yet heard any definition of what you mean by intelligence. I hold that you can have the association of ideas apart from human intelligence—

The CHAIRMAN.—It is the difficulty of the paper before us, if I understand it rightly, that that amount of intelligence is not admitted.

Captain FISHBOURNE.—I think the paper does admit it in the case of the parrot and the nut.

Mr. WAINWRIGHT.—You see we cannot give distinctive names to these operations in the *psûc* of the bird. I take them to be nothing else than the operations of a certain spirit, if I may use the term, without, of course, meaning that immaterial and immortal spirit which we possess. I make very much of what was said by Professor MacDonald as to man being the only created being who has the power of making offensive and defensive weapons. That is a great point of difference between man and the lower animals. Then, again, man has the power of using spoken language. There has been a sort of attempt to place the cawing of a rook on a level with—what shall I say?—the eloquence of Chatham: but surely there is a great difference in the sounds which issue from a rookery and the eloquence of the forum. If you say that animals have reason and language, you must grant them ideas suitable to their mental condition; but you would hardly expect them to write histories and epics which should rival the works of Herodotus, Milton, and Homer. Mr. Morshead says that the Andaman Islanders, the Bushmen and Veddahs, have always a natural consciousness of the distinction between good and evil, although their notions of what is good and what is evil may not coincide with ours. But I think there is a distinction between men and brutes which far transcends that in importance. Brutes have been taught to do the most unheard-of things, but there is one faculty which they have never yet been found to possess, and which is never wanting in man, however low or degraded he may be:—the brute has no capacity for veneration and worship. You may teach a dog to hold its paws together, bow its head, and remain still for five minutes as if at its prayers; but you never will succeed in eliciting any little fragment of conduct from it which shall so far impose on you as to make you think the dog has acquired the least atom of your idea of worship. If you say there are some exceptions among humanity, and that some races of people have been found who do not worship, then I say that those exceptions have never been authenticated, and I am not convinced. All men pay some sort of veneration and worship to the Supreme Being to whom worship is due: it may be blind, bloody, cruel, violent, as you like, but still it is a form of worship proceeding from the idea that there is a Power to whom they owe protection, and whom they must propitiate. But assuming for the moment that the Andaman Islanders have no knowledge of a God, I put it to you whether the fact that they have become so degraded as to be outside the pale of humanity does not establish my position, that the knowledge and worship of God not only belongs to the human race, but belongs peculiarly to them, and is not to be found among the lower animals? Truly I think all research and inquiry go to prove that of man alone it can be said that there is a spirit in him, and the breath of the Almighty hath given him understanding.

The CHAIRMAN.—I do not think Mr. Morshead's paper has been so

satisfactory in its definitions as it might have been, and if it had been a little more definite a great deal of misconception would have been avoided. We all have, in the rough, general ideas of what we mean by intellect, reason, and instinct; and I know it is difficult to give definitions which satisfactorily comprehend the distinctions between the three terms. Paley's definition of instinct, given in Mr. Morshead's paper, that it is "a propensity prior to experience and independent of instruction," is an excellent one, which we always use; but in reasoning upon this subject we must be careful to bear in mind that man himself possesses instinct, frequently—nay, constantly—acts upon it, and sometimes finds himself in a difficulty in which he cannot distinguish the source of his own acts—whether they have been instinctive or the result of reason. There have been a vast number of very curious phenomena deduced from nature concerning the habits of the lower animals, and particularly of the invertebrate animals; for there we are met with the most astonishing results of instinct, many of which appear to be the work of reason, but which may really be traced up to the certain action of instinct. Take the case mentioned by Mr. Row of the bees which took possession of an empty hive in his garden. Now, at first sight that does appear to be the result of considerable intelligence, but it is really attributable to the natural instinct of the bee. Those who have observed bees carefully know that they never swarm until they have found a suitable habitation; for they would be destroyed by a heavy shower of rain, and they therefore send forth scouts to secure a good habitation, and do not swarm unless the weather is favourable, and until their future home is provided for them. That, therefore, may be referred to instinct. But there is another very peculiar fact about them, which may be referred to what we may term latent instinct. I am speaking now of the ordinary hive bees; for it must be borne in mind that there are in this country something like 250 different species of bees, all having different instincts and habits. In the case of the hive bees, at a certain specified time, when they know that preparations must be made for the eggs of the future queens, they construct cells for them of a character totally different from and much larger than their ordinary cells. But if the queen dies, and you take away the cells containing the eggs of the future queens, what do they do? They know instinctively—for that must be instinctive which they cannot have learnt from experience—what is the right thing to do at once in order to provide a new queen. They destroy the partitions between a certain number of ordinary cells, so as to make one large queen's cell, and the grub of an ordinary bee is placed in it and treated with a different kind of food from the rest until it is absolutely developed into a queen, though under ordinary circumstances it would have been a wax-maker or a neuter. Another remarkable fact about bees may be referred to instinct. The death's-head moth is very destructive to the bees, if it can once manage to get within the hive, and it attracts the bees by emitting a peculiar sound like that which the queen bee emits in the hive. If the moth gets within the hive and makes that sound, it paralyzes all the bees, and they are completely at its mercy. Now, the death's-head moth is generally an exceedingly scarce

moth ; but in those seasons when it is abundant—and I am following Kirby and Spence in the relation of this fact—the bees construct defences at the entrance to the hive, making the entrance too narrow for the moth to penetrate, but still capable of admitting all the bees themselves. These things are the results of instinct; but if we do admit a low degree of intellect in the case of the inferior animals—and that is all that is required—we shall not at all trench on the higher points of man's nature, for we should only be admitting that which has been spoken of as animal intelligence—that which Mr. Wainwright referred to under the phrase "association of ideas," but which after all is something more than mere memory. As an instance of what I mean, let me take a case at random. Take the case of a wasp which has attacked and killed a fly. He finds he cannot take it away bodily as it is, so he first takes off one wing and then another, and so on, removing the carcase piecemeal—

MR. REDDIE.—I do not see how so light a thing as a fly's wing would be sufficient to interfere with the successful carrying away of the whole body.

THE CHAIRMAN.—If the wasp were to endeavour to carry a fly with its wings upon it through any wind, it would be one of the most difficult things for it to accomplish—

MR. REDDIE.—But how could you tell that the wings had not been "fumbled" off the fly's body, and not taken off purposely at all?

THE CHAIRMAN.—Because in such a case the wings show marks of excision by means of the wasp's jaws. We should be careful to give sufficient allowance in our definitions, so as not to contradict that which is according to nature, and I think Mr. Morshead has scarcely done that. I am rather led myself by a valuable observation of Coleridge in his *Aids to Reflection*, in which he feels so strongly the force of the fact detailed by Hubert and other authorities with regard to the bee and the ant, and in which he states that the great distinction between man and the inferior animals is found in the possession by man of what you would call the religious faculty—of reason, not using the term in the sense of mere intelligence, but meaning by it the highest faculty which man possesses. He admits that, besides instinct, animals possess intelligence, but not reason, according to his definition of it. We are so accustomed, however, to use the terms "reason" and "intelligence" as synonymous, that it will perhaps be better if instead of using the word "reason" here, we substitute for it "religious instinct," although that is an unfortunate phrase in many respects. By the way, how very deficient we find language is when we want to express these subtle differences! If we accept that definition, I think Mr. Row and Mr. Wainwright and the rest of us would all be brought into complete accord upon the subject. There is a certain unfortunate vagueness about some parts of Mr. Morshead's paper; for it does seem to admit in one place a certain degree of intelligence in animals, and yet it seems to deny it in another. I think the terms "instinct" and "memory" are not sufficient to account for all that has been done by animals. Animals have an intelligence—

infinitely below man's, of course, and incapable of being educated up to any proximity to human intelligence ; but still it is a very different thing from instinct. Pure instinct is in its way as perfect as the highest powers of man's intelligence. Indeed, the cell of the bee and the web of the spider, so constructed as to be adapted for the weather of several days in advance, are infinitely more perfect than anything produced by human reason: they are perfect in themselves and incapable of improvement. But beyond this instinct, which man shares with animals, though in a much less degree, they have some amount of intelligence, not of the same high quality as man's. But the manifestation of this intelligence is not found increasing from the lower grades of animals up to the higher in proportion to their physical development: the fact is rather the reverse of this. We do not go to baboons or apes for the highest degree of animal intelligence. We find probably the highest degree of intelligence in vertebrate animals in the dog. In the same way the brains and the intelligence of the elephantine creatures are very small indeed in proportion to the size of their bodies. But if we want to beat the intelligence of the dog we have to go to the invertebrate creation, and we find it in the ant and the bee, and in many of the insect tribes, developed to its highest extent. There is the agricultural ant, for instance, which cleanses the land of weeds, sows the seed, reaps it when ripe, stores it up for use, and when it begins to sprout from moisture, it brings it out into the sun, dries it, and carefully rejects the spoilt grain not worth drying. These acts indicate so much of intelligent power that we must admit the existence of something more than instinct in the case.

Captain FISHBOURNE.—I hold that that is a case of instinct. A man in such a case would not be able to discover that the seed had lost its germinating principle. The insect does discover it, but by instinct, not by reason.

The CHAIRMAN.—I do not think you can carry it so far as that.

Professor MACDONALD.—Stupid as men are, they are able to perceive when the grain is spoilt.

The CHAIRMAN.—I think this shows that the subject is by no means exhausted, and it would be interesting to renew it at some future time.

The meeting was then adjourned.

ORDINARY MEETING, MARCH 16, 1868.

THE REV. WALTER MITCHELL, M.A., VICE-PRESIDENT, IN
THE CHAIR.

The Minutes of the last Meeting were read and confirmed.

The Secretary announced that the following Books had been presented to the Institute :—

A Complete Course of Biblical and Theological Instruction, in accordance with the principles of the United Church of England and Ireland.
Vols. II. and III. By the Rev. Joseph Baylee, D.D.

From the Author.

The Rev. A. DE LA MARE then read the following paper :—

ON THEOLOGY AS A SCIENCE. By THE REV.
A. DE LA MARE, M.A., *Mem. Vict. Inst.*

IT will, I presume, be conceded by all, that, on the hypothesis that Theology, as it is commonly accepted among us, is true, its importance and its claims can scarcely be exaggerated. Dealing with truths confessedly beyond the grasp of unaided reason, which not even the imaginative faculty in man would seem to have been equal to originate, and which, when accepted, his most laboured processes fail to reach; truths beyond the sphere of ordinary observation and experiment—supernatural, limitless, essential; truths, moreover, which constitute the basis of all his varied relations with the high, the holy, the infinite One; by which also his inner being, his life of lofty aspirations and noble promise, is moulded; theological truth, if established, is surely beyond all estimate as truth—truth pure and simple; and its practical bearing and issues priceless, peerless.

Again, it will, I presume, be conceded by all, on the hypothesis that Theology is a science properly so called, that it must take rank among other sciences corresponding to the rank which the truths of Theology hold amongst other truths; and, if so, then that Theological science, its importance and

its claims, can scarcely be exaggerated; that for scope it stands without a rival, resting for its basis on Deity, and in its issues comprehending the entire human family; and for effectual working it influences the life spiritual as well as natural, whether in its physical, intellectual, or moral aspect, and pronounces judiciously the destiny of every human being in its damnatory or exculpatory utterances, and each for eternity.

I have said above, Theology as it is commonly accepted among us; for we cannot ignore the fact that, whether as regards its component truths or their systematic treatment, Theology is by some altogether rejected, either as a puerility which the intellectual manhood of our race has outgrown, or as an imposture which priestcraft and its abettors wield either for self-aggrandisement, or to trammel the legitimate exercise of free thought: a simple absurdity in the estimate of the one class—a dishonesty, and therefore a badge of disgrace, in the view of the other. To write for men taking up either of these positions, would obviously be impertinent. We occupy no common ground, and could, therefore, have no room for argument. The Atheist, repudiating the very existence of a God, not only could not accept, but must complacently smile at a thesis which, from first to last, recognizes the Deity whom he ignores; and the Infidel, whose loftiest idea of the God-head is of some artificer on a mighty scale, whose laboratory has been submitted to our inspection and enjoyment, perchance to the emendations of our higher intelligence, would equally reject an argument based on the utterances of One whom he acknowledges only in creation, and even there without, as it seems to me, pushing his admission to its logical and legitimate consequences. This paper, then, based, as of necessity it is, on the acknowledgment of a living God—for to write on Theology without recognizing a God would be as absurd as to treat of geology without recognizing our planet; and, moreover, not only on the acknowledgment of a God, but of *the* God of Theology, the God which Theology sets forth; and, therefore, on the acknowledgment of the books which are esteemed as sacred amongst us, the inspired revelation of the Divine will—for, again, to treat of Theology and ignore its records would be as senseless as to treat of geology and pass by the “Testimony of the Rocks” and the “Sermons in Stones” of that large and deeply interesting science:—this paper, as it is not written for, so it can expect to find no favour with, either the Atheist or the Infidel; but to all in whom Atheism or Infidelity is not a foregone conclusion, who accept the Holy Scriptures as the Word of God (the dis-

tinctive basis of membership of the Victoria Institute), it is submitted, not as an exhaustive, but rather as a suggestive tractate, tentative rather than complete, and seeks to awaken a dispassionate consideration of its subject, assuredly well worthy of being calmly and philosophically weighed by men anxious to discriminate between the true and the false; to give to all true science its legitimate status, and eliminate whatever has only the name or semblance of science, by whomsoever installed, and how widely soever retained within the honourable and charmed circle.

I will add one more preliminary remark, with more especial reference to the mere Theist. Surely, once admit the existence of a personal God—not an abstraction, not matter, not nature, not law, not force—a living personal God, and His utterances, however conveyed, by seer or by vision, by audible voice or inward illumination, by a spiritual afflatus from without or a spiritual witness within,—His utterances, if only conveyed in a mode worthy of Himself and worthy of the ends to be compassed, ought to be implicitly received. And this, both on rational and moral grounds. For the very notion of a personal God involves the idea of perfection; and perfection in Deity is nothing less than infinite perfection. Is it, then, conceivable that the Deity should act towards the works of His hands as no mere impotent and fallible artificer would act towards his perishing products—make them, and then fling them unheeded to be a sport to every passing and destructive agent? Is this conceivable of any intelligent being? Does the parent neglect, forsake, disown his offspring, cast him upon the world, expose him to the world's ill, and all without one warning word, one directing maxim? How utterly inconceivable, then, is all this on the part of a personal, living, perfect God. Better, methinks, ignore His existence than degrade His character. Better not believe that there exists a God of perfect attributes, perfect in His works and in His ways, than believe that He is, and yet heeds not, hath never spoken to, deserts His own intelligent creature. A God less reasonable in administration than the rudest artisan! more heartless than many of the most abandoned of our race, yea, of the very abjects!

And now we approach our immediate subject—Theology as a science. And at the outset I feel deeply impressed that this paper cannot adequately or even approximately do justice to it. A large and comprehensive subject, sufficiently treated, demands a large and comprehensive intellect and corresponding scholarship—very much larger than I venture to lay claim to. I aspire, then, to no more than the lowliest pioneer work,

to draw attention to the theme, happy if in its treatment I do not damage it in the estimation of those more competent to discuss it than myself.

It is obvious that Theology comes into more or less contact with other and distinct branches of science; and although she spurns not, neither does she court the homage of any. Thus, *e.g.*, Metaphysical science not only recognizes, but, to a very considerable extent, identifies itself with Theology. For without retaining the divisions of the early schools, in the enumerations of Leibnitz, and under the title of Theodicy, she specifically enumerates Metaphysical Theology. Now, with an unfeigned admiration of Metaphysics, especially when loyal to the highest department of truth, I know not whether Theology has gained or suffered most by the alliance; for if some Metaphysicians of more chastened spirit and higher aims have honoured both their science and themselves by legitimately applying it to and vindicating the claims of Theology, others, alas, by murky mystifications, have only obscured what was before plain to all but themselves, and have overlaid with philosophical difficulties that which we doubt not they had purposed to elucidate. But it is not with mental science alone that Theology comes into contact, either of agreement or conflict. Propounding a cosmogony of its own, irrespective of general physics, and laying claim to an antecedent authority, Theology cannot but have a bearing upon the natural sciences, as astronomy, geology, mineralogy; nor be without relation to the experimental and applied branches, chemistry, heat, electricity, magnetism. The antagonism with astronomy into which she was once forced is a matter of history, though happily now a thing of the past; and the hostility presented by geology, perhaps never more rife than in this our day, is only too painfully paraded before our eyes. We do not deprecate this—Theology does not; and the Theological student evinces an unworthy distrust of his science when he in any measure shrinks from such attacks. I believe that every investigation fairly conducted will ultimately advance the consolidation of every separate branch of human science into one grand and consistent total; and that the truth so arrived at will be in full harmony with divine truth, one essential verity. And, further, I believe that to this end Theology will have nothing to concede and little to modify; merely to put aside interpretations which never were her own, and so eliminate every element of disagreement.

In considering Theology as a science, it is needful before proceeding further to note the kind of science to which it belongs. The classification which recognizes the exact sciences, whether pure or mixed, as based upon necessary truth and

admitting of an exact and rigid demonstration, implies that there are inexact branches, resting on truths of less essential force and incapable of rigid demonstration, and yet sciences. And the further classification which admits the distribution into natural and experimental sciences, resting respectively as a basis upon observed or tested phenomena, implies that branches of truth may be accepted as real sciences, though incomplete—incomplete only to the extent to which the observations or experiments have not extended. Now, if these be sound data, abiding by these it would seem sufficient to indicate in this paper that Theology satisfies any one, even the lowest of these conditions; such, however, would not satisfy my purpose, and I therefore at once avow, that I regard Theology as not only vindicating to itself the first rank, but as fulfilling the conditions of each department inclusive; in its separate parts and aspects presenting to us both an exact and an experimental science—exact as based upon necessary truths of divine revelation, *necessary* though capable of being very variously enunciated; and *experimental* as sustained by all-sufficient phenomena, whether of observation or experiment. Nor is such a position suicidal, nor such the vicious course of proving too much. Of all sciences, that which is perhaps accounted the most firmly established is astronomy, and what is the basis of astronomy but a corresponding amalgam—in part necessary truth, in part observation, and in part experiment? and in each, I venture to affirm, of a lower grade respectively than those on which Theology is established.

I. Theology as an exact science.—In this branch of my subject I purpose to ignore all non-essential subdivisions. I shall regard neither “positive” nor “popular” Theology, so called; neither “exegetical” nor “historical,” as such; but comprehending whatever, in both natural and revealed religion, makes for my purpose, and blending all systematically—the teachings of the Deity in both His work and word—endeavour to evolve, or at least indicate, the sources of a true philosophy.

Natural Theology, by the testimony of an inspired writer, presents to the whole human family an indelible truth—the Being and patent attributes of the Deity: “For the *invisible* things of Him from the creation of the world are clearly seen, *being understood by the things that are made*, even His eternal power and Godhead,” or “divinity”—a more systematic enunciation only of the utterance of the Psalmist, “The heavens declare the glory [honour] of God, and the firmament [expansion] sheweth His handy work.” Now, the “divinity” of the Creator being recognized, and also His “power” and

"honour," sufficient ground is afforded for the theory of Godhead which proclaims perfection of character; for when the operations and issues are perfect, and rebound to the honour of the artificer, these, in themselves and so far, satisfy the requirements of thought for a perfect being, and, as a consequence, suggest a perfect artificer—God. But a perfect being will, amongst other perfections, possess the attribute of perfect truth, and consequently his every utterance will partake of this attribute, and be perfect truth. And this I take to be the very highest form of necessary truth; for being perfect, it is not only necessary so far as it reaches, but its grasp is perfect; it is the *full* utterance in respect of that which it utters. And hence the truths of revelation are essentially necessary truths. They might be conveyed in varying expressions more or less complex, but the truth would remain the same—the same in kind, in extent, in force. A system, therefore, grounded on Divine revelation is an exact system; such a science an exact science—I venture to think *the* exact science—not only that which has foundations, but whose foundations are sure.

The foregoing conclusion is, I think, fortified by considering the negative side of the argument. The sacred books give us definitions not only of what God is, but of what He is not; and with reference to this very attribute of truth, we have perhaps the plainest declaration of all, "God that cannot lie." If, then, the definition that God is "truth" have a co-ordinate definition, "God that cannot lie," not only is His word truth, but truth without any admixture—the perfect embodiment of necessary truth.

And now, as to the mode of using the Sacred Books in this matter. I know no more safe, no more simple method of establishing a science, where it is applicable, than that adopted in certain branches of mathematics. The method, *e.g.*, in geometry, which, in order to make the whole subject thoroughly intelligible, exactly and positively explains its several terms, and provides a working apparatus, by certain concessions which it demands, and the enunciation of certain patent verities which it allows none to question or ignore—in a word, a system of definitions, postulates, and axioms, sufficient alike for its several operations and processes, and for its various modes of demonstration. And in this manner I purpose to proceed here.

Now, the definitions of Theology appear to me to lie in all those almost numberless and authoritative sayings which pronounce upon the nature and character of persons and things. Thus, concerning the Godhead, we read: "God is,"

that is, exists ; " God is a spirit ; " " the Lord our God [Gods] is one God ; " " the Lord God omnipotent reigneth." Again, as belonging to this essential existence—this absolute entity, we read of some thirty or forty attributes, or properties, which satisfy to the full every requirement of an exact definition. Thus also, concerning man, we read that he is a creature—" God created man,"—that he is a complex creature, compounded of " body," " soul," and " spirit"—a creature possessed of certain powers, both physiological and psychological—" understanding, will, affections, conscience,"—and specifically that he is a sinning creature, but capable of renewal in himself and of restoration to his forfeited inheritance. And all this in definitive terms, language as positive as it is plain. Thus also, as concerning the great end of all being, " The Lord hath made all things for Himself ; " the relation between the Creator and the creature, " By grace are ye saved ; " the present and future states of the latter, and the whole bearing of the dispensations and processes by which the ultimate issue is to be attained. In a word, all the great points which it is the purpose of Theology to establish, rest on declarations which, for clearness and force, are second to none that in other branches of science, even the most exact, are accepted as definitions, and acted upon without hesitation.

Next, the postulates of Theology are, I think, to be found in such positions as the following, and which are not only congruous with the principles and utterances of the revelation, and directly flow from them, but also with all right reason and lawful concession. Let it be granted that the Deity, by His attributes of omnipotence and benevolence—both deductions of mere natural Theology—is able and willing to reveal Himself to His creatures ; let it be granted that the revelation, in order to its being available to such creatures, must, in form and matter, be adapted to their receptive capacity ; and further, let it be granted that such revelation has been given ; and we have all we need for elaborating a system of Theological truth, wanting no one element of an exact science. Or, to express our postulates subjectively : granted that man *can* receive a revelation from God ; granted that, if received, it will be such an one as he can use ; and, once more, granted that he possesses this ; and I think I am justified in saying that we have, so far, an apparatus sufficient to establish all which this paper proposes.

Once more as to axioms. I find the Sacred Books abounding in truths not only of axiomatic form, but, to me, of unquestionable axiomatic force. For example, " He that cometh to God must believe that He is [exists] ; " contrariety

or defect herein involving a manifest absurdity. Again, "God is a spirit, and they that worship Him must worship Him in spirit;" surely, a self-evident truth—the highest to receive the highest homage, as man is more honoured who receives honour of his fellows than of inferior natures, and most honoured who receives it of the most honourable. And yet again, "the spirit witnesseth with our spirit," as essential a verity in true Theology, as in mental philosophy, that intellect acts upon intellect, or, in moral philosophy, that the moral sense vibrates to the touch of moral inspiration.

Now, in these enumerations, the suggested definitions, postulates, and axioms of a Theological science, I beg to be distinctly understood as submitting them, not as the only, nor perhaps as the highest or best examples that could be adduced, but merely as indicating the kind of apparatus at hand, and the exhaustless mine whence it can, almost without limit, be evolved; and with such materials, these and kindred data, it is quite possible to build up a system of Theology in full accordance with scientific processes and modes of thought—in one word, an exact science.

But here, perhaps, demurrers may be put in, or even protests entered, which it will be well at once to meet. I may be charged with (1) employing an apparatus in itself defective or inexact, or (2) of applying it in a case wherein it is inadmissible, or (3) of importing into a scientific investigation an element or elements which science ignores or repudiates. Let me devote a few remarks to each of these points. And, first, as to the defective or inexact character of the apparatus. I presume that every scientific man is content to accept mathematical science upon its merits; that he admits, in any given branch, that the basis suffices for the superstructure. Thus, as the branch which I have had more especially in view in this paper, that the definitions, axioms, and postulates of geometry are scientific, or at least are neither so defective nor inexact as to endanger the claim of geometry to be a legitimate science. If so, I ask what is the first definition of plane geometry, the initial letter of the scientific alphabet, but a bare idea? and this idea, moreover, defined negatively, and only negatively. "A point is that which hath no parts and no magnitude." In other words, the fundamental definition—so exact a description as to leave no room to confound the thing defined with any other thing—merely tells us what that thing has not. We call it a point, but it is *exactly* nothing; and if we seek to locate it, or to present it to the eye, its very location overleaps, and its visibility is destructive of the definition itself. And if we pass to other branches or to general analysis, the same

weakness, if it be weakness, is constantly presenting itself. Our sense of exactitude is not quite borne out by such algebraic formulæ as the following: something multiplied by nothing is nothing; something divided by nothing is infinite; and nothing divided by nothing is almost anything. And yet these are the utterances of pure science. Or, to glance at higher branches, the differential or integral calculus, not only the calculi themselves, but some of their most vaunted theorems, rest on principles and are couched in language barely as intelligible as the foregoing, and far more conflicting. And if, from the region of pure we pass to mixed mathematics, noting the necessary connection which subsists between them, and the dependence, so far, of the latter upon the former, and only glance, for instance, at the laws of motion, and how these laws enter into and modify, if they do not determine, some of the highest problems of perhaps our noblest, and certainly our most exact, of all physical sciences, astronomy, surely the weakness, if it be weakness, does not vanish. And yet scientific men accept mathematical processes and conclusions, and consider the various propositions *proved*. Now, if a weakness or obscurity, or even the absence of absolute exactness, be enough whereon to reject a definition, and the fault of either kind so vitiate such definition that the process depending upon it fails,—and the process failing the conclusion is untenable,—and if, further, the grafting such conclusions into some kindred science or branch, this latter, too, must be eliminated; and, pursuing the same course, every branch resting upon it directly or indirectly, must be rejected, it would seem that mathematical science, with its vast and magnificent coil of connected sciences, is like a cone resting upon its apex, in danger of being overturned, and the whole series, with all else of kindred uselessness, swept into the limbo of discarded systems. But I have no fear of this result. The definition and expressions in question suffice for the purposes to which they are applied, and are accounted valid for the processes in which they find place; and if this be so—if a fundamental definition, which simply tells us what the thing defined is not, suffice, as it does, where we find it, what defect or want of exactitude impairs the truths which I have ventured to instance as the kind of definitions which theological science offers? “A point is that which hath no parts, or which hath no magnitude.” Granted; but who can exhibit it? who perceive it? Side by side with this, and in the light of the created universe, read “*God is;*” and where is it not depicted, and who sees it not? “A line is length without breadth,” and “a straight line is that which lies evenly between its extreme points.” Granted; but who

ever drew either the one or the other? Given the fairest conceivable surface and the finest conceivable instrument, and who needs the aid of the microscope to detect breadth as well as length, and endless divergences to the right hand and the left? Side by side with these, and in the light of the same created universe, its history and its course, read "the Lord God omnipotent reigneth;" and when has this ever been disproved, and what single witness really brings it into doubt? For myself, I am not prepared to give up even the dicta of mathematics, sufficient for mental processes, even though contradicting the senses; and the dicta of our Sacred Books I hold to be utterly irrefragable, sufficing for both mental and spiritual processes, though materialism would ignore and rationalism emasculate them.

Again, I may be charged with applying this apparatus in a case where it is inadmissible. We know where it does avail; in the instance already given, geometry. And we know how far it avails, to absolute demonstration—demonstration according to the requirements in each given case, direct or indirect. Now, accepting the necessity for demonstration herein of one or another form, either such evidence of the reason as establishes the proposition beyond doubt, or as clearly exhibits the contrary proposition to be untenable and absurd, surely there is no unsuitability of the process or apparatus to the subject. It is admitted by all who stop short of actual Atheism, that the created universe exhibits positive demonstration of the existence of the Deity, and therefore so far the ground is secure. And this secured, the proposition assumes a different character: it passes from exact science as to argument, and from experimental science as to observed phenomena, into purely ethical science—ethics, in the largest sense, as teaching man not only his relation to his fellows—social duties generally—but his especial relation to his Creator, and the duties growing out of the record which his Creator has given him. Now, if our process and apparatus hold in pure mathematics—mental science,—and if it hold in ethics proper, is it to be excluded from and held to be inapplicable to the purest and highest of all mental science, and the broadest and most comprehensive ethics, both bound up in Theology? There is not, perhaps, a term in the whole vocabulary of science more prostituted than the word *proof*. Too often the merest hypothesis, the most slipshod generalization, even an individual dictum passes current for proof. Not that really scientific men are thus deluded, or delude themselves; but such counterfeits are allowed to circulate (alas! that they should ever bear the imprimatur of honoured names), and that for which science should

reserve its highest niche, *PROOF*, is supplanted by a delusion or a dream. In the application of the geometrical apparatus, it would be no difficult though an ungracious task to point out almost more than equivocal gaps; *e.g.*, the last axiom, a distinct proposition rather than an axiom; and the allegation of coincident points, or, divesting it of scientific verbiage, coincident nothings. But the application of our theological apparatus involves no such drawbacks: the data are the utterances of unmixed truth, and the processes, if only logically conducted, are superior to either human weakness or alloy.

Once more, I may be charged with importing into a scientific investigation an element or elements which science ignores or repudiates. The two points to which I refer are, 1st, the recognition of *spiritual* truth as supplemental to physical and moral truth; and, 2ndly, the medium of its reception, *faith*, as the complement of the faculties by which we take cognizance of these. The belief in spiritual being is, and has ever been, world-wide. Our Sacred Books announce "that the things which are seen were not made of things which do appear;" and this patent truth is probably the basis of this wide-spread and deep-rooted conviction. Hence the Eons of the Platonic philosophy; hence the various myths and demiurgic theories which have from time to time found favour. Further, the human mind has ever attributed to such spiritual existences superhuman powers: to the good and true, a surpassing truth and goodness; to the false and malignant, an intensification of evil. Now, with this universal recognition of spiritual being, whether by tradition or ratiocination, by personal intuition or external impress, we stay not to inquire; but this recognition being unquestionable, is it philosophical to ignore all spiritual being in scientific investigations which may involve or come into contact with this notion? Again, spiritual existence being conceded, is it philosophical to ignore its operations, especially in the workings of truth, eclipsing, if authentic, all human verities in scope and grasp? And, once more, if any system of truth be extant, claiming to be the revelations of the Eternal and Infinite Spirit, having every stamp, external and internal, of its parentage, can this be safely ignored whenever the student seeks for the *whole* truth in things never so remotely bearing upon it? Can it, without signal failure, in things bound up with and depending upon it? Now, we believe that we have this record, and how do we propose to use it? Primarily, as we use all truth, systematically, and in accordance with both literary and scientific practice; and, ultimately, according to its own declared canon of interpretation, withal eminently scientific, "comparing spiritual

things with spiritual." And here we are indirectly but substantially supported by our adopted type, geometry. Why ignore the idea of spiritual existence and operation? Why brand these as unscientific and inadmissible? Is it because we can form no adequate notion of spirit or of its modes of operation? that it is impalpable, not cognizable by the senses, reducible to no law? And what more adequate idea can we form of infinity, infinite space, and operations including the application of infinity? Is this one iota more palpable, more cognizable by the senses, more easily reducible to law—the laws which apply to finite things? And yet the recognition of infinity underlies the whole structure of geometry, not only in its preliminaries but its processes. Thus, "parallel straight lines are such as are in the same plane, and which, being produced ever so far both ways, do not meet." *Ever so far, that is indefinitely, infinitely.* Thus, in the postulates, the working implements, things demanded as *capable of being done*, we have "that a terminated straight line may be produced to any length in a straight line;" *to any length, that is infinity.* And, again, "a circle may be described from any centre, at any distance from that centre;" *at any distance, that is, as all other distances, so an infinite distance!* whatever that may be. Whilst one of the early *problems* demands the use of a line of *unlimited length*, i.e. *an infinite line.* If, then, the *infinite* be admissible in strict science, why not the *spiritual* in Theology? Especially when the infinite is cognizable only by the intellect; the spiritual, in at least a vast portion of the human family, by the inner and deeper consciousness as well as the intellect. This concentration of every evidential element alone seems to meet the requirements of the case. By this only does the great problem seem capable of being solved; by this only can the inwrought aspirations of man be satisfied. That some ignore and scout, what others hold with the firmest grasp, is not confined to Theology or even pure science.

As regards the medium, *faith*, I would simply suggest that, wholly irrespective of its being the accredited medium, it is the necessary one, and, however disclaimed, it enters into almost every branch of known science. It has been well said that "faith is as necessary a condition of mind in natural as in revealed religion, and in philosophy as in both. He who goes beyond phenomena and speculates upon being itself, must assert principles from which a sarcastic criticism can deduce contradictions manifold, or he must believe nothing at all beyond his own existence and perception. Even atheism and the coarsest materialism have their hypotheses and *faith*, and therefore materials for credulity." Now, every science claims

to prescribe its *modus operandi*, and Theology, in its higher and more spiritual portions, enjoins *faith*; on the broad and intelligible principle that "the things of the spirit are only spiritually discerned." And are we in all this to be twitted as dealing in arcana? as appealing only to the initiated? and our system to be branded as a mere shibboleth? If so, surely "arcana," in the least desirable sense of the term, attach not to Theology alone; neither do theological hypotheses alone indulge in the marvellous or claim passport by a watchword. Let, then, each and every science be fully met and fairly dealt with; let all foregone conclusions be thrust aside, and every pretension stand or fall on its own merits. There are vigorous intellects whose aspirations go to and fro through the universe. There are intellects of equal calibre whose aspirations pierce beyond the universe; own no limit, material or mental; and embrace things spiritual as well as cosmical. Let not, then, on the one hand, the supercilious smile which would charge weakness; nor, on the other, the repellent frown which speaks distrust, find place here. The votary of physical science may often marvel at not only dullards but the astute, who fail to entertain or appreciate his subject; and the theologian may often marvel at the self-imposed limit by which, in turn, the man of physical science fails to entertain or appreciate his branch. Let only both, each and all, as *confrères* and comrades, strive in honourable rivalry to draw forth truth, and assuredly, in the end, no pseudo-science will stand, and no real science lose its fitting place.

II. And now I approach the consideration of Theology in its less exact aspect, as a mixed science, presenting phenomena both of observation and experiment; and I purpose to treat this part of my subject under the twofold division thus suggested. In the broad field of observation, the first place must be conceded to Natural Theology. And here I should feel constrained to consider this branch in detail, and more particularly some of its great leading problems, did I not remember that in papers already in our *Journal of Transactions*, and especially in the inaugural address of our Vice-President, Mr. Mitchell, the subject, so far as I have occasion to employ it, has been most ably and conclusively treated. All I ask is, that Natural Theology be accepted as proclaiming a *personal* God—not deified matter, not deified force, not deified law;—not Pantheism, with its visible aggregate, nor Polytheism, with its invisible legions;—not Positivism, with its deified abstract Humanity, its unvarying inflexible course of events; but a *personal* God, ruling over, not restrained by the observed order of things, the one great architect of all visible design;

the one great legislator of all ascertained laws ; the one great executive of universal sway. And to arrive at this we cite as evidence no more than even the grudging science of Professor Tyndall admits—matter and force,—though happily we reach a very different conclusion. He, if rightly reported, tells us that “we are all children of the sun ; we must own our celestial pedigree along with the frog, the worm, and even those terrible fellows, the monkey and the gorilla.” And, with him, we are quite ready to “own our celestial pedigree,” and moreover along with all created being ; but not of the sun, but of Him whose handiwork the sun itself is ; nor on the same platform with all creaturehood, but elevated far above it, even as spirit rises above matter, or the likeness of the Creator above every being of a lower type. True, the Professor admits that “to the combination and resolution of matter and force is confined the entire play of the scientific intellect,” and that “men of science—physical philosophers—as such must all be materialists.” Happily we are enfranchised with a more generous freedom, and, recognizing to the full the legitimate domain of physical science, grasp firmly that larger and higher body of truth of which physical science is but one phase. Assuming, therefore, that Natural Theology on her part does demonstrate the existence of a personal God, of power and benevolence, and in both infinite, so far as such an attribute can be gleaned from the contemplation of finite things, I pass on to the Sacred Books,—the revelation by word of Him of whom the universe is the manifestation by work, and to the consideration of their intrinsic character and contents, their value as a basis of scientific truth.

It must be obvious that the several classes of truth embraced in God’s word, in their most meagre enumeration, forbid any separate treatment, even the most limited, which we might be disposed to afford them. The very existence of the Bible, its cosmogony, ethnology, psychology, ethics, history—its supernatural element—its theism—its theocracy, material, national, social, individual, spiritual—its inspiration—its miracles—even these, and the several phases of these, utterly bar out a separate examination. I shall therefore address myself to one and only one element, the last enumerated—miracles. And I shall do this also under only one aspect—prophecy. For I hold that miracle, in its most legitimate use, includes prophecy : miracle, a wonder, something above human power,—a wonder wrought, a miracle of operation—a wonder spoken, a miracle of illumination. Prescience is not an attribute of man. If, therefore, we find events mentioned

in records confessedly anterior to those events, predicted too with a circumstantial exactness which negatives all idea of a mere fortuitous accomplishment, sometimes embracing the most improbable, almost contrariant, statements, utterly hopeless of being realized by the most laboured adaptation; surely here is miracle—either a miracle of *fore-knowledge* or of *after-power*. And, here again, but for the labour of others, I should be constrained to enter more at large into this matter, and to endeavour to meet objections to miracles instead of simply utilizing the miraculous element, adducing them as evidence. This work has, however, been very ably and sufficiently done by Mr. English in his paper read before this Institute during our last session, and therefore passing by all objections here, from the earliest to perhaps the latest sceptical utterance on this subject—from Mr. Hume's notorious, and to my mind untenable, position, that a miracle is contrary to experience, down to Mr. Crawford's dictum, if rightly reported, at the recent meeting of the British Association at Dundee, that "a miracle is a cause inadmissible in science, or at least ought to be restricted to one great and for ever inscrutable secret—the creation itself;" thus, in one breath, both excluding and admitting a miracle—excluding what seems inconvenient to his theory, admitting what the very senses conspire to witness, the miracle of creation; passing by all objections in this place, I proceed to suggest, by way of example, the following observed phenomena, selected especially on this ground, that in each and all the priority of the records cannot be questioned, the respective accomplishments, either in their past or current effects, being patent to this hour.

My first example is the Sacred Record itself. I shall not touch the points arising out of the claim to Divine inspiration, either as to any particular theory, its mode, or its extent; but confining our test to the prophetic element, we need only to establish the one relation between the two parts of which it consists, that of clear succession in point of date—undoubted priority of the predictions to their respective accomplishments—in a word, that the assumed are real predictions. We know that this has been questioned, and upon what ground—itsself a testimony to the exactness of the fulfilments. We know also how ably and conclusively our position, even by means of a searching criticism, has been fortified; witness the noble works of Dr. Pusey on "Daniel," and Dr. Payne Smith on "Isaiah." We have also, no mean support or advantage, the general connection between sacred and profane history—in no measure at proved variance with the

scope, and in a large measure confirmatory of the details of our chronology, certainly so far as the relation between Jewish and Christian history is concerned. Our strongest ground, however, lies in the fact that our records are the records of religious rivals, and rivals, moreover, with no mean measure of the *odium theologicum*; and that they have been catalogued, warded, and hedged around in a manner that no other records have ever been. The bare mention of the well-known fact that the Jewish sacred books were so analyzed and tabulated, that not only their divisional and verbal, but even their literal correctness is guaranteed; and that, with a veneration amounting well nigh to superstition, the Jews not only applied a species of Cabalism to their Scriptures, but in their Masoretic notes and points descended to the very alphabetic component characters; and we have a security for the perfect accuracy of their books, as they have come down to us, which the student in vain seeks for in any others. Place side by side with this fact the early formation of the Christian canon, and the jealous care and discrimination by which some books were excluded and some retained, and we have another pledge for not only the genuineness and authenticity of the component parts, but for the truth and accuracy of the entire collection.

And with thoroughly trustworthy Jewish Scriptures and unimpeachable Canonical Books, the desired evidence of succession is secured, and the reality of prediction and fulfilment established. The early distich fully sets forth our position:—

“ In vetere testamento novum latet,
In novo testamento vetus patet ”—

a position as tenable now as in all past times, and which justifies the further and greater conclusion of the general value of our Sacred Books, in their integrity, as a basis of scientific truth.

My next example is the revelation respecting the person of the founder of Christianity, one of the great central truths of Theology. Now, true or false, no man can deny that the particulars, as predicted in the old Scriptures, and recited in the New, are, to say the least, marvellously coincident. Were we to sit down to write a life of the Saviour, with no other available authorities than the prophetic writings, we might from the several authors, and at various dates, so fully delineate every important feature, as almost to leave nothing for the historian, in the actual portraiture, to supply. Thus we could set forth His genealogy; His exceptional conception

and birth; the time, place, and circumstances of it; His early dangers; His high and holy qualities; His manner of life; His prophetic, priestly, and kingly offices; and the salient points of His death, resurrection, and ascension. Again, as to the Divine side of His character, we might advance from His marvellous generation to His Godhead, as witnessed by the ascription to Him of every attribute, title, and operation of Deity; His headship over the Church; His mediatorial dignity; His office of dispenser of Divine gifts; His designation to be the final judge. And, once more, and more noticeable as apparently conflicting predictions, and reconcilable only on the hypothesis of His conjoint nature, God-man, we learn that He was to be both Son of God and son of Man: David's son, yet David's Lord—Messias the suffering, yet Messias the glorified one. Now, with only the indication of these points—and they might be largely extended—can we reconcile so many, so precise, and yet so diversified predictions; some, too, so unique, so inconceivable and seemingly so conflicting, all finding a full and exact satisfaction, a perfect embodiment in the person of Jesus Christ, save on the ground that the predictions and the accomplishments were both of God? Can we evade the testimony to the truth of both dispensations which they afford, and therefore the stamp of accuracy, as a scientific basis, which they set upon the Sacred Books? Nor is this a testimony of the past only, but a current and future testimony: the investigation and comparison are as seasonable now as when they were first possible, and the witness they give appeals to every successive generation and every individual student.

We have a third example in the Jews as a people. And here I shall purposely pass by all the cumulative evidence which does not consequentially reach down to our day; not by reason of any inherent defect or weakness in the facts, but in order to present only that which comes legitimately within the scope of exact observation. The Jewish people, then, confessedly once a nation among nations—a people of considerable power and influence among powerful and influential peoples—played no mean part in the early history of our race. Their origin, consolidation, and career are not myths of a pre-historic period, nor the details of their polity the conjectures and guesses of pre-historic times. They are records, and such records as are extant of no contemporary race. What the Jewish people are now is patent to the world. We say advisedly to the world, for they are everywhere, and everywhere the same. A people—who can gainsay it?—a people

in sentiment, in habit, in physiology; a people in banishment, in suffering, in oppression; cosmopolitan in presence, though not in citizenship; a people without a realm; whose religion two thousand years of exile has not availed to crush; whose aspirations and expectations are unquenched, and would seem unquenchable. Is there any parallel for this—any approximation to it? Egypt and Assyria, Babylon and Persia, Greece and Rome have been: some still enjoy “a local habitation,” all “a name.” But where are the peoples? What their histories? Are any “scattered” everywhere—“peeled,” “trodden down,” “a byword” and “a reproach,” and yet a people? Strange diversity, and yet more strange resemblance! The antecedents, the courses, the issues all have one source—the Divine will. The Jews have been, and are, what the Sacred Books predicted, and our experience to this day verifies. The nations have been, are or are not, what, accomplished or as yet unaccomplished, the same books foretell. The nations, more or less ephemeral, supply a passing witness; the Jews, a continuous evidence of nigh four thousand years—and, what is more to our purpose, a standing witness of to-day. The Jew stands before the world *this day* the living attestation to the truth of the Bible, friends or foes being the judges. History furnishes no second example, save perhaps the case of the Arab—kindred, yet diverse. And this, if alleged, is but an additional witness; for the annals of both accord. Contemporary in origin, they have run a contemporary course; and each, this day, verifies its particular destiny. The prediction of three thousand years, therefore, has in both cases its accomplishment before our eyes; and since none can predict but Deity, we have clearly the word of Deity in our hands, and, as such, emphatically a fitting basis of scientific truth.

My last example is the visible embodiment of Theology—the Christian Church. In the year 28 of the Christian era, the historian relates that amid the mountain ranges of Upper Galilee a little group of peasants stood round their leader, and that from that leader’s lips fell words, either of high mysterious import, or of almost inconceivable vaunt and impotence:—“On this rock will I build my church, and the gates of hell shall not prevail against it.” One brief year only elapses, and all seems marvellously changed. The leader has died a felon’s death and found an early grave, and his adherents, cowed and scattered, cease to be a band. And yet more marvellous issues succeed. The dispirited and dispersed reappear as heroes. A company is consolidated. It grows, grows on—on, till not only, phoenix-like, it rises into new life,

but with a vigour and power unknown to its earlier phase—onward till it embraces peoples and kings, and is established in the high places of the earth; onward to this hour, ever expanding, ever deepening and strengthening, victorious over every adversary, undaunted, majestic, defiant—“fair as the moon, clear as the sun, and terrible as an army with banners.” The alleged solution of all this is simply that the leader was the embodiment of what prophets had foretold—was the Messiah of Israel, incarnate God; and that, raised from the dead, He had once more rallied these men around Him, and endowed them with superhuman strength for their work; in one word, that these Galilean peasants, be they illiterate fishermen or contemned publicans, were God-appointed servants—were the prime agents for enacting the Master’s will—were the master-builders of the promised Church. History affords no parallel to this. History speaks of several who advanced equally high, yea, the very same pretensions, and grounded them upon the same alleged manifestations. Pseudo-Messiahs many, pretenders to thaumaturgy, surrounding themselves with followers, challenging the national mind, awakening the national prejudices, endangering the national peace. And where are they, one and all? “*Nubecula est transibit.*” (Ephemeral impostors, they passed away, and for ever.) We know their names and their crimes; they have no other memorial.

Other pretensions also have been advanced, and other pretenders have come upon the world’s stage. He, emphatically called the false prophet, Mahomet, and his system survives. But neither here is there any real parallel. The characters of the respective founders; the systems they founded; the principles, morals, maxims, motives, hopes, and ends, are not only diverse, but antagonistic. The one is only a second form or religious development of a purely secular polity; the other, a kingdom not of this world: the one has not only inherent elements of dissolution, but is already tottering to its fall; the other rests on nothing short of a purely spiritual basis, which time itself cannot overthrow, and no earthly power or event can weaken.

Those who reject our Sacred Books will, of course, protest against any reference to the revealed accounts of these several examples as unphilosophical. I ask such, is it philosophical to accept existing phenomena and to rest content without any sufficient solution? Eliminate the revealed element, and you have an existing institution for which you can assign no adequate origin. Assume, if you will, in the founder, the enthusiasm, nay, the ecstasy of humanity—invest every Apostle

with the heroism of a demigod, and the premises fail. Earthly powers may accomplish earthly results; but no earthly intellect can foreknow and foretell. On such an hypothesis an illiterate peasant penetrates the veil of two thousand years, and, with oracular power, proclaims its highest marvel. Grant the revealed element, and philosophy is satisfied; an obvious phenomenon is traced up to an adequate cause. But this done, and all is conceded which we ask. Theology then rests on a divinely inspired record, established on evidence external and internal, and is built up on not only the sure logic of truth, but on the inexorable logic of facts.

Before proceeding to my last division, I would devote one paragraph to confessedly a very important item in scientific investigations—analogy. Analogous reasoning is by no means foreign to Theology. The sacred writers adopt it; the schoolmen employ it; one, at least, of the ancient creeds embodies it; whilst its importance in inductive philosophy is unquestioned. I hesitate not, therefore, to employ it here, and to a subject seemingly the most abstruse in the whole range of theological truth—the tri-unity of the Godhead. Since this is neither the place nor time for proving the doctrine of the Trinity to be a truth of revelation, I here at once assume it so to be, merely noting that it clearly enters into the earlier dispensation and more ancient writings in a germinal form, an adumbration; and in the later dispensation and more recent writings in its development, a clear dogma. With the view of exhibiting the absolute agreement subsisting among all the evidential portions of theology and their harmony as a whole, I would suggest some few, I venture to think not unimportant, analogies between the truth thus enunciated and what may be gleaned from our cosmical system.

Take, first, the law of attraction,—one principle, but of threefold action,—the attraction of gravitation, the action of the larger body upon the lesser,—the attraction of cohesion, the mutual action of the component particles of each given body,—and chemical attraction, the combination of particles having mutual affinities; yet are these not three, but one great principle. Take the motions of the heavenly bodies,—the motion of each planet on its axis, the further motion of the planetary system round the sun, and the yet more general movement of the solar system, with all other systems, through space: three distinct motions combined into one harmonious progression. Again, consider light, a triple compound, the solar spectrum in reality consisting of three spectra—the luminous, the calorific, and the actinic. The luminous spectrum again sub-compounded into the yellow, the red, and the blue

rays. Atmospheric air, again, a triple compound—three gases so blended as to sustain life, any one of which, inhaled alone, would destroy it. Water, also, is of a triple constitution, at least in respect of its accidents, being water, or ice, or steam, according to the quantity of heat inherent in it at the moment. So, also, is electricity of triple constitution. Again, take the human subject—consider man. He has, first, a bodily organization; second, a principle of life in common with all animals; third, a principle of mind peculiar to himself. In his bodily organization, again, he has a threefold vital mechanism,—the heart, the lungs, and the brain, emphatically, I believe, called by anatomists “the tripod of life,” circulation, respiration, and sensation being the means by which he lives, moves, and communicates with the outer world. His nervous system also is threefold—the motor nerves, moving the limbs; the sentient nerves, conveying the intimations of the senses to the mind; and the ganglionic, neither motive nor sentient, but presiding over the organic life, growth, and nutriment of the body. Yet these three, united in one brain, constitute in reality but one nervous system. Again, man as a reasonable creature. His mind is tripartite, consisting of the intellectual, the moral, and the voluntary powers; and further, in the exercise of his intelligence, his processes of argumentation seem to follow the same law; *e.g.*, the syllogistic form. Take the colloquial formulæ by which he expresses his relation to either time or space; *e.g.*, the past, the present, the future—man’s standpoint, and, in connection with it, either above and below, on the right hand and on the left, in front and in the rear. Take his expressions for space in the exact sciences,—positive, zero, negative; or positive, infinite, negative. Take intercepted motion: the impact, the arrest, the recoil; or the commingling of two opposite waves of sound and the mute point of junction, or of two opposite rays of light and the inferred point of darkness. And, with more or less of exactness, these instances might be almost indefinitely multiplied. Now, we venture to ask, is all this a purely fanciful generalization; or is it within the limits of, and conformable to, a sound philosophical conclusion, to regard all as the mark of the Great First Cause upon His mundane work; the stamp on all things of His own recondite essence; “the image,” faint it may be, and “the superscription,” illegible possibly by some, but which truly shadow forth the Cæsar of all Cæsars, the designer of all designs, the great Central Being whose they one and all are, and to whom they one and all point? I know that triplex arrangements in given objects, more or less fanciful, have long been alleged as *illustrations* of the triune Godhead. Thus the roots, the

trunk, and the branches of a tree ; the wax, the stamp, and the impression of a seal ; and the Elizabethan poet writes :—

“ If in a three-square glasse, as thick as cleare,
 (Being but dark earth, though made diaphanall,)
 Beauties divine, that ravish, seeme appeare,
 Making the soule with ioy in trance to fall ;
 What then, my soule, shalt thou in heav’n behold,
 In that cleare mirror of the Trinity ? ”

I claim, however, a deeper significancy and a higher standpoint for the foregoing. Illustrations they may be and are ; but beyond this, if “ reality and similarity of relation, and not actual resemblance, be what analogy denotes,” I submit them as so many physical or mental analogues of the revealed tripartite constitution of the Godhead ; the mute, but not less eloquent tribute of the seen to the unseen ; of created things and order to the revealed hypostases of Deity. Spectrum analysis *by analogy*, pronounces upon the presence or absence of certain known substances in the several heavenly bodies upon which that science has been employed ; and, *by analogy*, I believe that Theology pronounces upon the particular being of God—an analogy not one iota less trustworthy, and of far longer and larger application.

And now we reach our last division—Experimental Theology. Here we obviously quit both the material and purely mental, for the spiritual ; and here, therefore, we encounter in full force the objection of mere materialistic science to the importation of an element the existence of which it ignores, and too many of its advocates loudly deny. I therefore premise, in brief, one or two general considerations. What is experimental science but an operation, or series of operations, by which some unknown truth, or principle, or effect, is sought to be discovered, or, being discovered, is sought to be established ? In physical science, experiment is of the last importance ; and so it is whenever it is practicable. When applied to some branches, it certainly fails to supply the *experimentum crucis* ; yet, so far as it holds, its evidence is in all cases trustworthy. Now, I purpose to apply the method to Theology on this *lower* assumption ; not making it the crucial test, but a sound and valid supplemental branch. Again, if it be alleged that experiment applies only so far as the subject is cognizable by the *senses*—that, especially and emphatically, spiritual powers and operations are beyond its tests—I ask, is the evidence of the *unaided* senses always enough and conclusive ? Do the eye, the ear, the touch never delude—and that, too, not tyros nor sciolists, but experienced and accredited

men of science? If so, what need of all the elaborate and complex apparatus which physical science lays under contribution in her operations? Whence even observations which do not accord, and experiments which contradict each other? Moreover, is any observation or any experiment, *per se*, of worth—the single act of observing, or the manipulating act in experimenting? or rather these submitted to and determined upon by the action of the mind? And if this be so—if even in physics, observations and experiments must be supplemented by mental processes, is experiment inapplicable to mental science, or to any branch simply independent of, not opposed to, the senses? Is moral science incapable of experiment?—the response of the outer life to the deep down inner principles of right and wrong? But if the mind revolve, ponder, and decide, supplemental to observation or experiment by the senses, and quite beyond the cognizance of others; and if the conscience, still deeper down in man's nature, arbitrate, often without any process of reasoning, by a moral instinct, and wholly irrespective of the outer senses, why exclude spiritual operations? why ignore or deny spiritual powers, because they, too, elude the outward observation? If a certain class of scientific men complacently deny the existence of a spiritual nature in man, because they do not perceive it, and have no experience of it, others may, with equal consistency, deny the existence of a moral nature, because they do not perceive, have no experience of, and care not for it;—just as a blind man who, knowing nothing and having no experience of sight, may deny its existence; or the idiot, whose mental blank permits him not to recognize the powers of mind in others, may believe all to be like himself. But, assuredly, these both are patent fallacies. I take it that spiritual results speak the existence of a spiritual power, even as mental and physical results speak the existence of mental and physical powers; and that we are as strictly scientific when we deal with the one class of phenomena as when we deal with the other classes. Indeed, man is so essentially a spiritual being and agent, that, quench the utterances and stay the actions of this higher and inner life, and you despoil him of his especial characteristic, obscure his noblest attributes, and mar his loftiest ends. Surely man has long and far advanced beyond the mere life of the senses; and the deep inmost throb of his consciousness for something beyond and above all that the senses can descry, is neither the animal nor the merely moral, but the spiritual want of his nature; the evidence of that spiritual life which suggests the crowning analogy between him and his Maker; a triple being of body,

soul, and spirit; the living reflection of the Father, the Son, and the Holy Ghost.

Passing, then, from objective to subjective Theology—from a system of truth propounded for belief to that system in operation—from the creed to the believer, we pass into the domain of practical life, surely the fitting sphere of all legitimate experiment. And here I purpose to glance at three salient points:—the commencement, the course, and the close of the life spiritual; in other words, the Christian's spiritual *consciousness, testimony, and trust*. These points respectively answer to distinct and positive statements in God's Word, and are among the great ends of all theological truth. Thus, the commencement, "Verily, verily, I say unto thee, except a man be born again [from above], he cannot see the kingdom of God;" "Except a man be born of water and of the Spirit, he cannot enter into the kingdom of God;" and "That which is born of the Spirit is spirit;"—the course, "If any man be in Christ, he is a new creature;" "I live, yet not I, but Christ liveth in me;"—and the close, "He that soweth to the Spirit, shall of the Spirit reap life everlasting;" and "Christ in you the hope of glory." Now here are three distinct issues,—three fair tests:—1. That the believer has received a higher and supplemental life; from birth a natural man after the flesh, from the new birth a spiritual man after the Spirit. 2. That his life is modified by, or rather is the proper exponent of, his new and spiritual birth; a new creature and in all things; his former self subordinated to his inner self, his outer life moulded by his higher being. 3. That his spiritual inheritance, sustaining him throughout, issues in glory.

In certain schools of thought we know that all human advancement is traced to two sources—individual development and external civilization; and, within their respective limits, I question not the value or the achievements of either. I accept, however, another channel, that which history and experience alike attest, and which presents phenomena for which the others and all others offer no sufficient explanation. As all three positions belong to classes and not to individuals only, and each therefore may be regarded as typical rather than individual, and thus be taken out of the category of mere personal investigation, I purpose so to treat each here. My first position, then, is that experimentally the believer has received a supplemental life, a new birth, a spiritual existence. Now, consider the Apostles in the brief interval between the betrayal of their leader and the day of Pentecost. One boldly denied, one and all were renegades; two "had hoped," but

hope was dead; one disbelieved, and others had reverted to their old calling, "I go a-fishing;" "we also go with thee." A few weeks elapse, and all craven fears are gone. Wherefore? They had witnessed a spectacle which held them as by a spell; they had heard words, hanging upon which they waited earnestly from day to day for the promise; and at length, gathered in one place, they entered that upper chamber for the last time as mere expectants, and emerged confessors and heroes, some soon to be martyrs. This is history, if any history be extant; and the key to all is, that the Spirit had descended upon them—they had been born from above. Nothing else in the narrative—nothing that any school of thought suggests, explains the phenomena. Another instance. St. Paul leaves Jerusalem, breathing slaughter against "all of this way," and when he reaches Damascus he is a believer; henceforth his every instinct is bent backwards; Saul is now Paul, the persecutor has become the Apostle. He, too, has seen a light, heard a voice, felt a power, and he is changed, born of the Spirit. Nothing but this satisfies the facts of the case. And these are types; not alone these, *e.g.*, the jailer at Philippi, Lydia, and others, and reproduced in myriads of cases from that day to this. Not always as obvious, but always as real. As well believe vegetable and animal life to have no cause, as believe spiritual life to have none. As well believe animal and mental and moral life not diverse, as believe that spiritual life differs not from each and all. Of all perceptible things, nothing is so perceptible; of all reality, nothing so real as that which stirs the soul and vibrates through the spirit that is in man.

2ndly. That the believer's course is the proper exponent of this new and spiritual birth—his outer life the reflection of his inner being. Again I draw my example from apostolic times. On receiving the spiritual life, the first demand of St. Paul was—"What wilt Thou have me to do?" When the time of his departure was at hand, his note of spiritual triumph was—"I have fought a good fight, I have finished my course, I have kept the faith." What that fight, course, and faith were, I need not here detail. No pure fiction is more marvellous; no conceivable career less earth-born; no achievements more noble. Philosophy presents no parallel; philanthropy no rival; humanity no equal. It was the legitimate "fruit of the Spirit." Again, the disciples, as a body. A.D. 33, ushered in a great persecution of the Church at Jerusalem, and the disciples were scattered abroad, except the Apostles, and they that were scattered abroad went everywhere preaching the Word. Now, whether we regard

the Apostles continuing at Jerusalem, the centre of persecution,—men who had left all for Christ, and would now leave Christ for no man; or the disciples preaching, labouring, suffering everywhere, and both the one and the other, as the necessity arose, sealing their labours and their testimony with their blood, we have a devotion to truth which, so far as I know, no disciple of science has ever emulated, and a course which mere intellectuality has never exhibited, and for which mere self-cultivation, with all the appliances of civilized life, is no adequate preparation. It is the fruit of the Spirit. And from that hour to this the same fruit—the same in kind, if different in measure—has been borne throughout the Christian Church; and from St. Paul to the sainted Henry Martyn, “the tent-maker” of Tarsus to the Senior Wrangler of Cambridge; and from “the Areopagite,” and “those of Cæsar’s household,” and “the honourable women not a few,” down to Schwartz and Brainerd, and Neff and Newton (once the blaspheming slave-driver), “men who counted not their lives dear unto them,” yea, and the whole family of the new-born, the evidence is one and unbroken, the experiment holds in all its breadth: the new birth is the forerunner of the new life—where the Spirit dwells, thence issue the fruits of the Spirit.

3rdly. The believer’s spiritual inheritance sustains him to the last, and issues in glory. To this let our sacred penman speak. St. Paul, testifying that he had kept the faith to the end, adds this rooted conviction:—“Henceforth there is laid up for me a crown of righteousness, which the Lord, the righteous Judge, shall give me at that day, and not me only, but unto all those also who love His appearing.” St. James encourages thus:—“Be patient, stablish your hearts, for the coming of the Lord draweth nigh.” St. Peter: “Knowing that shortly I must put off my tabernacle, even as our Lord Jesus Christ hath showed me.” St. John: “Beloved, now are we the sons of God, and it doth not yet appear what we shall be; but we know that when He shall appear, we shall be like Him, for we shall see Him as He is.” And St. Jude: “Beloved, building up yourselves on your most holy faith, praying in the Holy Ghost, keep yourselves in the love of God, looking for the mercy of our Lord Jesus Christ unto eternal life.” But the crowning testimony remains—the true *experimentum crucis*—the individual test. St. Stephen: In the agonies of a violent death, at the moment that the departing spirit was quitting the body, the proto-martyr’s triumphant cry was, “Lord Jesus, receive my spirit.” And from the stoned outside Jerusalem to the burned at Smithfield and

Oxford and Gloucester—from the holy Stephen down to the martyrs of the Reformation—our Cranmers and Latimers and Ridleys—and onward to this hour, confessors have never been wanting, nor have triumphs failed. Not enthusiasts, not fanatics, not dolts, but sober thinkers, solid intellects, pure spirits—our Bacons and our Newtons, our Lockes and our Miltons—sainted women and untainted children—prince and peasant, learned and unlearned, gentle and simple—multitudes innumerable have lived and died as they—nay, rather, died, and now live as they—their departure an euthanasia, their inheritance a crown. Surely Christianity is worse than a mere delusion, and its founder low down in the catalogue of impostors, if this inwrought conviction and dependence be a cheat. Yes, Christianity stands or falls as a whole. Either a masterpiece of craft, folly, and lies, or an imperishable monument of honesty and soberness and truth. True, Paganism and Mohammedanism, and even Atheism, can boast their victims; and these truly have braved death. But the believer does not brave death, he hails life—no conjectural transmigration, no carnal paradise, no blank annihilation—*LIFE*; an undying, unchanging spiritual being, begun below, and perfected and perpetuated above.

I have now completed the task contemplated in this paper—how faultily and imperfectly I am fully and painfully conscious. As I hinted at the outset, far from pretending to be exhaustive, it is simply suggestive; rather indicating the course which seems to be open to the theologian than really occupying it. I have, of set purpose, endeavoured to avoid polemics, and to treat Theology, *per se*, pure and simple. I have observed neither partial nor dispensational limits; neither patristic, mediæval, nor modern divisions. I have passed by the conjectures and assumptions of the “higher criticism,” the figment of a “verifying faculty,” and the inflated pretensions of the vaunted “theology of the nineteenth century.” I have followed no particular ecclesiastical leading, no partisan bias. I have taken Theology as I find it—theology proper—grounded on its conjoint bases, creation and revelation, the work and the word of God. I now simply ask, Is Theology, from a scientific standpoint, so fallacious or so effete, that it ought to be thrust at once and for ever beyond the pale of the sciences as a system long since exploded—a *caput mortuum*? or is it not only a science, but the *facile princeps* of all sciences, satisfying every condition of a true philosophy, and admitting, in its several bearings, of every modification of proof? I speak as to wise men, judge ye.

Surely if there be one characteristic of our age more prominent than another, it is that of comprehensiveness rather than of exclusion—of so-called large-heartedness rather than narrowness of mind. We have had scientific theories *ad nauseam*—theories almost to the obscuration of science: our nebular theory, our vulcanic theory, our plutonic theory respecting the earth—and each has had its day and passed current as science. We have had theories of man's origin and status; theories of development, of selection, of spontaneous generation; theories of optimism, of perfectibility, of utilitarianism: and each has been accounted a science, and each has numbered its disciples. From the optimism of Leibnitz, and the perfectibility of Turgot and Condorcet, down to the positivism of Comte, whether the utterances of a religious seriousness vindicating God, or of a philosophical infidelity deifying man, culminating in a sheer empiricism, semi-scientific with its "hierarchical order," and steeped in superstition with its "worship of humanity,"—"the systematic idealization of final sociability," whatever that may mean—none has been excluded, each one has been accounted science. Theology alone, in the judgment and suffrage of some, is under the ban. If all the foregoing are rightly included, we ought perhaps not to complain that Theology is excluded.

I say all this in unfeigned love of legitimate science, and a corresponding admiration of really scientific men; and I am persuaded that from neither the one nor the other of these has either Theology or the Theologian anything to fear. Those with whom we have to do battle are men—really scientific men, it may be, in their own particular branches—who quietly ignore our system, which, we fear, they have never examined, and with whom its rejection is therefore a foregone conclusion. How far this is philosophical I leave to them to determine. We allege no oppugnancy between other sciences and Theology. Our deep conviction is, that all branches of true science are really and fully at one, and that it needs only that the good and the true should be separated from the refuse and the vile, and each branch of science pushed faithfully, and honestly, and logically, to its legitimate issues, to make this oneness abundantly apparent. If, however, men of any particular school of thought whatever, will represent and labour to exhibit an antagonism between the partial truths and facts of science, and the perfect truth and operations of God, the only safe standpoint in the controversy for every Christian man is that of St. Paul in a somewhat analogous position, "*Let God be true, and every man a liar.*"

The CHAIRMAN.—I am sure you all feel very much indebted to Mr. De La Mare for his interesting paper, more especially as it relates to so much that this society was founded to bring before the notice of the public, and I beg to propose that the thanks of the meeting be given to the author. (Hear, hear.) I shall now be glad to hear any observations upon the paper.

Rev. C. A. Row.—I have given a great deal of consideration to the subject of the paper, and I think the easiest way in which I can deal with it now, will be not to discuss the whole of it, but to select merely one or two points on which to express my own views. While the paper was being read, I noted down no less than twenty-six of those points, and I think, if I were to attempt to discuss them all, I should not have finished by sunrise. I so far agree with Mr. De La Mare as to think it is possible to make theology more scientific than it is at present, but I cannot go further than that; and I think that we have no prospect of making theology a science in itself. To my mind, theology consists of, or rather is illustrated by, ten, twenty, or thirty totally distinct and separate sciences. Now just let me draw your attention to a few of the sources from which anything like a scientific theology must come, if we can possibly have a theological science at all. There are only two principles that can be applied to science,—the principle of induction and the principle of deduction. Is scientific theology an *à priori* or an *à posteriori* science? Until we determine that, we cannot advance one single step. The science of theology can only be founded on *à priori* science, so far as we are able to give to theology distinct and accurate definitions. Now several things have been mentioned in the paper as definitions and axioms, and so forth; but I have failed to find in any one of them that which would amount to a proper definition, and I cannot find any of them participating in the nature of axiomatic truth. In one passage, the word “perfect” has been used by Mr. De La Mare; but while he has applied it to the Deity in one sense, he has applied it to man in another. It may be a distinct and a positive truth when it is said that God is angry or furious; but those phrases are used, not in relation to Deity itself, but in relation to man’s conceptions of Deity. The Articles of the Church of England say most plainly and distinctly that the Deity has no body, parts, or passions; and the Deity, therefore, in relation to Himself is not angry or furious, while in relation to man’s conceptions this may be true. You see we are bound first, to distinguish between truth as applied to the Deity and as applied to man. *A priori* science is only possible where strict definition is possible. Bear in mind that I am not contending that there should be the strictly logical definition, consisting, in the phraseology of logicians, of *genus* and *differentia*; but until we can have a definition to describe one particular thing so as to distinguish it from everything else, such a science is not possible. The definitions in the first book of Euclid are rational in the strictest sense of the term, because they do separate and mark off the thing defined from every other object, although they are not logical. In Euclid, geometry deals with one idea of the human mind,—the idea of extension; but in theology, taking the word in the large sense, as it has been taken by

Mr. De La Mare, we have to deal with an endless number of things and ideas, and there is at the very outset a difficulty in respect of definition in some portions of theology which we are not yet in a position to surmount. Mr. De La Mare gives us as a theological definition, such a phrase as "God is a spirit." Now, that is no definition at all; it is simply a proposition, and nothing more. The only thing that approaches to axiomatic character in the instances given us in the paper, is that phrase "the Lord God omnipotent reigneth." If you assume that there is a Lord God, and that He is omnipotent, it is axiomatic to say that He reigneth, because that is involved in the one idea of the Lord God omnipotent; but it is absolutely impossible to represent any of those propositions or phrases as axioms or definitions. The *à priori* treatment of theology is a matter of great difficulty, and if we deal with it at all, we should want another Bacon to take it in hand in a new *Novum Organon*. The principle of deduction as applied to theology, is a sound principle and here, of course, I speak not of natural theology, but of revealed theology, taking in the whole extent of supernatural Divine revelation, and not the revelation of God in the natural universe, a matter which belongs to an entirely different branch of the subject, and to entirely different scientific principles. The Baconian principle, as rightly applied to Divine revelation, consists in a certain number of distinctive facts. One prominent fact lies at the basis of all Divine revelation—the great fact of the Incarnation. And here I find a difficulty in explaining myself, because our translation of the Scriptures is so inaccurate in some places as to make it impossible for those who have not studied the original tongues to follow me. I allude to the statement of the sacred writer that God has at sundry times and in divers ways spoken to us by the prophets, and that, in these last days, He has spoken to us by the Son. Now here the translation is unquestionably wrong. Those who are acquainted with the original Greek, know it sets forth that God has spoken to us not *by* the prophets, but *in* the prophets—not *by* the Son, but *in* the Son. The sacred writer means that God has spoken not only by the Son, but in the person of the Son. Now that makes all the difference in the world. The first point, then, is to ascertain distinctly and certainly the meaning of the words of the New Testament. We must translate the conceptions in Greek of the sacred writers into equally distinct and plain conceptions in the English language, and without that any treatment of theology in a scientific manner is altogether beside the purpose, and indeed impossible. I was struck yesterday by a point which shows how important it is that we should have precise and accurate translations of the words and phrases of Scripture. In the New Testament the terms which we translate by the word miracle are three in number. They are *σημεῖον*, *δύναμις*, and *τίμας*. Now, each of those has different meanings, but they are generally translated by the word miracle. Now St. John in his gospel has invariably used the word *σημεῖον*, which means a sign. It is impossible to suppose that he did not do that with a special intention and purpose, and that is altogether lost sight of when we have all these phrases

mixed up together under the one common term miracle. The word *σημεῖον* is a sign ; the word *τίρας* merely denotes a prodigy. Until we have some better basis to proceed upon than we have at present, we cannot reach a scientific system of theology—

Mr. REDDIE.—Will you allow me to ask, is it really your view that we cannot have a proper system of Christian theology unless we have a correct translation of the Greek Testament into English ?

Mr. ROW.—I did not mean to say that. What I mean is that we cannot properly have such a system until the New Testament is made accurately intelligible, not to those who read Greek, but to those who cannot read Greek.—

Mr. REDDIE.—The object of my interrogation was to point out that systematic Christian theology certainly did not wait until the English language had developed, or even till England became Christian, and so it cannot depend upon the translation of the Greek Testament into English.

Mr. ROW.—When I spoke of a system of scientific theology, I meant such a system as should be intelligible to the English public. The principle of induction ought to be applied to all the leading facts of the New Testament to arrive at the deductive view of Christian theology—

Captain FISHBOURNE.—I rise to order. I submit that all this is hardly germane to the paper before us, although Mr. Row is no doubt suggesting what would make a very good separate paper for discussion on another occasion.

The CHAIRMAN.—I think Mr. Row is not deviating from the subject before us. All that he has said fairly arises out of the paper, although I am sure we should also be glad to have from him a paper on the subject at another time. Such a paper, I am sure, would be very valuable.

Mr. ROW.—I have no objection to supply such a paper for one of our future meetings. (Hear, hear.) To return to Mr. De La Mare's paper. I will suppose that we have made a second induction on the facts of the New Testament. What is the next thing in order to found a scientific theology ? It would be to construct a theory to cover those facts exactly. In that we must exercise no common care. Everybody thinks he may start some theory of his own, and endeavour to make the facts agree with it. I have already said that I think Mr. De La Mare's views with regard to definition are not satisfactory. He gives us an example :—"God is a spirit, and they that worship Him must worship Him in spirit." But you cannot say that that is an axiom. The latter part is certainly axiomatic, if you assume the first part ; but that first part, that "God is a spirit," is a simple proposition. He also gives us an example, "God is ;" but neither is that a definition. It merely asserts as a positive fact that the Deity does exist, and it is a simple categorical assertion, which is not axiomatic in any sense. There is also in the paper a certain unsatisfactoriness in the use of the word "infinite." In mathematics the expressions "infinite" and "not finite" may be taken as co-extensive ; but when we speak of the infinite perfections of the Deity we mean something very different. We are guilty of

some degree of inaccuracy in coupling the word "infinite" with God's moral perfections. I apprehend that God's power and wisdom are infinite, but I cannot understand how the word infinite can be used with regard to His goodness. That attribute is a perfect attribute, and there is a difference between the perfect attributes and the infinite attributes of the Deity. That indistinctness which I mention on the part of Mr. De La Mare has led to great confusion, of a very serious character in theology. There is another passage to which I must take very great exception. Mr. De La Mare says: "Were we to sit down to write a life of the Saviour, with no other available authorities than the prophetic writings, we might, from the several authors, and at various dates, so fully delineate every important feature, as almost to leave nothing for the historian, in the actual portraiture, to supply." That passage does certainly seem to give to the rationalist of modern times a vantage-ground, the importance of which I can hardly express. It is a very strong assertion to say that from the prophetic writings of the Old Testament alone the life of the Saviour, delineating almost every important feature of that life, could be written. Prophecy is one thing after it has been fulfilled, but it is quite a different thing before it has been fulfilled. It will illustrate better what I mean if I say that possibly, hereafter, the Book of Revelation may be tolerably clear to our descendants, but certainly now it is all a mass of darkness. A stronger weapon than that furnished by Mr. De La Mare could hardly be placed in the hands of the modern rationalist who declines to pin his faith to the New Testament. With regard to another point, I cannot help thinking that that portion of the paper which deals with the analogical part of the subject has not been treated upon a scientific principle. I could heap up ten thousand similar instances to those which Mr. De La Mare has quoted. It is easy to say the world consists of earth, air, and sea, and so on. There is really no end of such speculations, and instead of its being founded on a Scriptural basis, it is really founded on nothing of the kind.

MR. WARINGTON.—I feel so very much with Mr. Row upon this subject, that if I were to attempt to go into it at any length to-night, I should have to raise such a long series of objections, that it would be necessary to create a new superstructure altogether upon the paper which has been read. I may say I agree here and there with Mr. De La Mare's views, but my reasons for doing so would be totally different from the reasons he has assigned. Under those circumstances I will confine my remarks to the analogies of the Trinity which have been instanced by Mr. De La Mare. He tells us, in the first place, that there is a threefold law of attraction—the attraction of gravitation, the attraction of cohesion, and chemical attraction, or the combination of particles having mutual affinity. Now it is an extremely disputed point whether there is any such thing at all as the attraction of cohesion, whether it is not a mere name for the absence of repelling force. The view held by many authorities is, that what we call the attraction of cohesion simply arises from the fact that there is no force to drive the particles away from one another. If that is so, we reduce our

trinity to a duality ; and this without touching the other question as to whether the attraction of gravitation may not be after all merely a modification of that other force, which we call chemical affinity. Then Mr. De La Mare tells us that there are three motions of the heavenly bodies—the motion of each planet on its axis, the motion of the planetary system round the sun, and the motion of the solar system with all other systems through space. I believe that last motion is also disputed ; and, if so, we once more reduce the three to two. In the next place we are told that light is a triple compound, the solar spectrum consisting of three spectra—the luminous, the calorific, and the actinic. But the student of physical science will tell you that all these are convertible one into the other, all three, in fact, being modifications of one force. In the next place we have an old fallacy, which I should have thought would by this time have vanished from every scientific mind ; that is, that the luminous spectrum is compounded of three colours, yellow, red, and blue. But what is the simple fact ? When you separate pure white light into its elements, you get, not three, but an infinite number of colours ; and if you take any one of these colours, you cannot further decompose it. Take purple, for instance ; can you separate that purple into blue and red ? No. If you have no evidence, then, that this colour is actually made up of blue and red, what is your scientific ground for stating this ? You may certainly take an artificially-made purple colour, and find that it consists of blue and red ; and if you mix blue and red together you get the impression of purple upon the eye. But take the actual purple ray, and you will find that you cannot separate it into anything else. In the eye of science, therefore, it is an entity of itself, quite as much as yellow, blue, and red. Every distinct shade of colour is an entity by itself, for the impression of each is produced by a particular rate of undulation in the medium through which the light passes, and these various shades cannot be separated into anything else. The luminous spectrum, therefore, is not composed of three parts, but of an infinite number of parts. Then Mr. De La Mare refers to atmospheric air, which he says is a triple compound made up of three gases. But I was not aware that it was a compound at all.—It is a mixture, and it is composed, not of three but of dozens and hundreds of gases. The two gases forming the greatest proportion of atmospheric air are oxygen and nitrogen. Then you have water, carbonic acid, and ammonia, next in quantity ; and then extremely minute traces of many other gases. There is evidently no trinity here. Mr. De La Mare also tells us that water is of a triple constitution, because it exists in the form of water, ice, and steam. But what is there of triple constitution here, because there are three forms in which water can exist ? We are told next that electricity is of triple constitution, but we are not told how. I have always understood that electricity was not of three, but of two forms—positive and negative, or, as some prefer to say, vitreous and resinous. We are told also that man is of triple constitution ; and here, indeed, Mr. De La Mare has a point in his favour. Man is composed of body, soul, and spirit, and we may fully admit that there is in that some analogy with the Divine Trinity.

But Mr. De La Mare goes beyond that, and says that man is of threefold vital mechanism, having heart, lungs, and brain ; but why are the muscles and bones to be left out ? I suppose because they would destroy the trinity. He also tells us that the nervous system is threefold, and that the mind is tripartite ; but I confess that I utterly fail to see the trinity that has been laid down in these points. Mr. De La Mare further says, that man's expressions in relation to space are threefold, because a thing may be on one side or the other, or in the middle. But if we come to analyze that, we find that "before" is a reality, and "behind" is a reality, but that "here" is a line. Now, what is a line ? A thing which has no extension. "Here," however much we may practically feel it, simply consists of that which is not before nor behind ; it is an inferential nothing, not past, nor future, but present. But that sort of analogy may be carried out with other numbers than three. Take two, for instance. I have two arms, two eyes, two ears ; and so I find the number two running through every part of the animal creation, and even in the vegetable creation. By the way, the term "animal and vegetable creation" shows in itself a duality in regard to the forms of life. I find that every part of a plant can be traced to the modification of the stem or leaf. If I am asked what are the functions of a plant, I answer two, reproduction and growth. In chemistry I find that the whole tendency of the science is to make everything binary. Electricity consists of two forces, and so we might run on with science after science, and find abundance of examples of the pre-eminence of two. According to this, then, if we adopt Mr. De La Mare's views, we have here a ground for believing that there are only two principles in Deity. But, I ask, would any one be prepared on such grounds to question the doctrines revealed in the Scriptures ? If not, how can such reasoning as this of Mr. De La Mare's be advanced in proof of the doctrine of the Trinity when it is of precisely the same character, only weaker ?

Rev. Dr. IRONS.—I appreciate so many things that have been said by Mr. De La Mare, that I should be very sorry indeed to speak at all severely or unkindly of his paper, although I do not agree with the whole of its contents. The paper is written with a deep religious sentiment, especially that part concerning the life and religion of the Christian soul, which was full of fervent piety. Having said that much, I must pause, because in almost every other respect I must say that I disagree with the whole tone and bearing of the essay. Mr. De La Mare seems to start with the idea that there is no scientific theology already existing, but that we must get one for ourselves somehow or other out of the Bible. If there be no such thing as a scientific theology at this time, I should be disposed to despair of our ever obtaining one, supposing we had to begin *de novo*. If we go back to St. John of Damascus at the end of the seventh century, soon after the birth of Mahomedanism, and after the extinction of the great Donatist heresy, we find that the Church had begun to feel most forcibly that it would not do to go on with an outline of a religion mixed up with the credulous and faulty opinions of individuals, as the substantial theology of the world. A great need was felt, and schools began to be formed. St. John of Damascus made it his business to draw

together the best of the various opinions of his own time, and to collate all the principal sayings of the most learned men of the two or three preceding ages. He did the work imperfectly, however, and his book on the orthodox faith was a condensation as well as a compilation, which was greatly improved by the illustrious Peter Lombard, "the Master of the Sentences," as he was called, who laid a better foundation for the ages to come after him. He began that work which has lasted until now ; and with all due deference to those who think theology is scientifically faulty and indefinite, I think nothing has been so permanent, so consistently maintained, or so little misunderstood as theology. You find the same arrangement in all the great surveys of the first, the middle, and the latest schools. Thomas Aquinas is considered to be the pattern doctor of theology. His great *Summa Theologiæ* is still one of our theological standard works. He begins in his *Prima Pars* by pointing out that all the primary truths of theology must be submitted to a close analysis of the human reason. He deals with the nature, being, and attributes of God, and more than a hundred other distinct sets of propositions ; and from that he advances to the consideration of the Trinity. But he does not leave out of his thought the possibility of other beings lying between God and man, and therefore he most suggestively inquires into the possibilities of heavenly and angelic existences. Thus in a most subtle and yet perfectly simple way he clears the ground, and puts aside all objections that must arise if he had not dealt with that point as a kind of episode. But who is that being who is to examine and consider the God who made him ? It is man. And so the second part of that great book is devoted to the examination of man and his duties. So that, after having discussed the first and general conditions of religion in the *Prima Pars*, we are invited in the *Secunda* to an extensive analysis of all the virtues. Then he comes naturally to the consideration of the union between man and God,—the Incarnation. He could not have discussed the Incarnation if he had not first of all examined what we believe concerning God, as well as what we believe concerning man ; because if Christ is to be both God and man, we must clear our minds as to what God is and as to what man is ; and this doctrine, as well as the career of our Blessed Master, will be found to depend on an exact understanding of what we mean by man as well as what we mean by God. The book next goes on to explain the system of the Church, in which the doctrine of the Incarnation has been most perfectly developed. The whole of the doctrine of the sacraments then naturally arises. This division of the *Summa Theologiæ* was not peculiar to St. Thomas Aquinas. You trace the same arrangement in William of Ockham and in Duns Scotus ; and for five hundred years you have the great schools of Christian theology dealing thus with the whole subject ; and now again you have scientific theology gaining ground. In the Church of Rome this is exhibited in a striking way, and I would to God it were here also ; for I am sure that the revival of it in the Roman Church will tend to deprive the modern dogmas of that Church of all support. A proper statement of the nature of the Incarnation will for ever destroy the doctrine of the "Immaculate Conception," as it is called. Let us rejoice that there is this tendency

to the revival of the old scientific theology in the Roman Church; and if there were the same in our own Church, we should be better protected from much heresy which has risen in the present age. But it would not be fair to Mr. De La Mare if we were to leave his essay entirely without criticism. I will say how it struck me as I heard it read. It occurred to me that it was not so much an outline of scientific theology as an attempt to set up a basis on which the popular religion of England is supposed, by itself, to rest. Instead of being scientific, it is popular. It is an attempt to assimilate religion and modern science, to devise a new science of theology, by dealing with the Scriptures as you would deal with Newton's *Principia*, or any other book of natural science. That is very natural and proper, and we cannot wonder that the popular Protestantism of the day should wish to have some such work done. But I am not disposed to allow that there is anything in the Bible which will supply us with definitions, axioms, and postulates. I am quite sure that they will not be found there, and it is a mistake to expect them; but even the effort to find them may be productive of good. The Holy Scriptures are God's gift to His people. They do not, however, give us a scientific theology; and the intelligence of the natural man can never make a scientific system out of them. We should, I think, altogether go astray if we were to accept all the views of Mr. De La Mare; but at the same time, if his paper only leads to a discussion of that large and important subject, some good may be done by it.

The CHAIRMAN.—I think, to some extent, the speakers have misunderstood the whole bearing and object of Mr. De La Mare's paper, and that may be owing to the different mode in which they have been accustomed to regard science. Some gentlemen regard science entirely from a logical point of view, and some of the speakers seem to think that the point of view from which Mr. De La Mare has regarded science has been that position from which science would be regarded by the student of what is called pure demonstrative science, that is to say, he has viewed it as an exact mathematical science. As far as I understood the paper, I must thoroughly agree, in spite of all the logical and scholastic objections, in its view that there is such a thing as theological science. I believe that it does exist, and that it is founded upon a firm basis—nay, a firmer basis than any of the so-called sciences, whether exact or inexact, of the present day. If we were to discuss the metaphysics of the question for a thousand years, we should never be likely to come to a cordial agreement and understanding. We cannot agree, for we cannot decide as to what are to be considered definitions, postulates, and axioms. Mr. De La Mare has pointed out in his paper that theological science is supposed to rest, like mathematics themselves, on definitions, postulates, and axioms; but sometimes it is difficult to say whether certain things are to be regarded as definitions, as axioms, or as postulates. I believe the distinction of definitions, axioms, and postulates in our modern Euclid does not exist in the original Greek. Now, Mr. Row has objected to certain things which Mr. De La Mare has called axioms, on the ground that they were not axioms

so much as they were propositions. But if we go to the axiomatic truths of mathematics, we find that many of them are merely propositions, but are regarded as axioms because they approve themselves to the mind as truths, or because they are incapable of further proof. A good instance of the latter class is the famous 12th axiom of Euclid, which is confessedly a proposition, and requires demonstrating as much as any other proposition. We find that the intellect of man, as far as it has been engaged on this subject, has failed to get a science of geometry which can rest only on axioms; and, therefore, those things which theology would take as the axioms of theology are not more faulty, after all, than some of the axioms on which you have to base the science of geometry. But when you get a little further in mathematics and take up your algebraical methods, you are obliged to assume certain things as axioms, which appear to the uninitiated intellect as hard to conceive as any of the mysteries revealed in the Bible. Take the well-known instance that "something divided by nothing is infinity," "nothing multiplied by nothing is still nothing," while "nothing divided by nothing may be anything." Those are matters which the metaphysician never can satisfactorily explain; they are altogether beyond man's comprehension. Students of the differential and integral calculus know that those are but small difficulties compared with others which they meet with in that part of mathematical science. If we turn from the purely demonstrative mathematical sciences to the applied ones, what basis have you for the axioms on which dynamics and mechanics are based? The three laws of motion are the practical axioms of dynamical science. Not one of these laws can be demonstrated by any experiment, or series of experiments. They are deduced from a vast number of facts, from each of which some particular cause of the failure of the law has to be deducted. And what, after all, is the final proof of the truth of these laws without which the problems of pure mathematical science cannot be applied to dynamical science? Why, the correspondence of the observed places of the moon and planets with those calculated on the assumption of the truth of these laws combined with the theory of gravitation! I believe most fully that you can even from the Bible itself, and without going to scholastic theology, take your stand on this, that there is a scientific theology in the Word of God. If there be a weak point in Mr. De La Mare's paper (and it is not unnatural that there should be one), I think it has been in some of those analogies which drew such severe comments from Mr. Warrington. But though I believe that some of the illustrations may have been faulty, yet the essential idea is true in itself. I do believe that the visible things in God's creation do manifest and set forth by types and shadows the deep truths of the invisible world. It is, I believe, a very common thought among theologians, and it is one which you will find illustrated by our Saviour's method of teaching. Whenever our Lord wished to convey to the human intellect a knowledge of the deepest spiritual truths, He took His examples from the works of God's own creation, taking, for instance, the seeds sown in the ground as a type and emblem of the word of God, and its effect upon the human heart. How did St. Paul

refute the man who denied the possibility of the resurrection? It was by calling him a fool, and pointing out to him a grain which was sown in the ground, and which sprung up again to a new life. But I quite agree with one thing said by Mr. Warington, that not only is there a remarkable trinity to be found shadowed forth throughout nature, but there is also a wonderful duality, which may be taken as setting forth to us one of those deep analogies by means of which we can only faintly comprehend the union in our Lord and Saviour Jesus Christ of that marvellous duality of God and man. I am only sorry that I did not put in my pocket before I came here a remarkable paper, now out of print, and printed under a pseudonym by one of our members. It is a parallel between the Athanasian Creed and some of those things which mathematical students are willing to accept as truths, whether comprehensible or incomprehensible. The great objection made by unbelievers to the doctrine of the Trinity, as set forth in the Athanasian Creed, is that it requires a reasonable man to believe things which no reasonable man ought to be called on to believe. Now, Professor Byrne, who is one of the greatest mathematicians, has given the Athanasian Creed, and put side by side with it certain mathematical conclusions admitted by mathematicians. Every one of these mathematical parallels is as difficult of comprehension, and demands as great an amount of faith, as the theological propositions against which they are placed. No one but a first-rate mathematician like Professor Byrne could have found that parallel, and I confess I should like to see it printed at the end of this lecture.

MR. REDDIE.—You propose to append Professor Byrne's parallel between the Athanasian Creed and certain algebraical methods of demonstration; but I think we should pause before agreeing to this; as it should be borne in mind that Professor Byrne believes, and is actually on the point of publishing a book to prove, that many of those algebraical demonstrations are full of absurdities and irrational propositions, which want altogether to be cleared out from true mathematical proof. And if we were to appear to make our theology depend upon an analogy with the demonstrations of algebra, and afterwards to have the first mathematician of the day telling us that those demonstrations are irrational and unreliable, what would become of our theology? Now, I am perfectly persuaded that there is such a thing as theological science, which can hold its ground rationally and logically, as well as, or better than, some of those other sciences which have been referred to. Many of the arguments which have been maintained by Mr. De La Mare, however, are not quite tenable. He says that the definition of parallel lines implies infinity, because they are two lines which continually produced shall never meet. But you may have a definition of parallel lines without implying infinity, as, for instance, two lines which cross a third line at precisely the same angle—

THE CHAIRMAN.—I believe Mr. Reddie will find that none of the axioms or definitions of parallel lines substituted for that of Euclid have been found satisfactory.

MR. REDDIE.—Neither is that in Euclid, and hence the existence of these

substitutes. But what I chiefly rose to observe is, that we should lower the science of theology to a very questionable level by introducing an illustration based upon methods of demonstration which belong only to the modern system of mathematics, the accuracy of which is in dispute, and which would not probably have been accepted by the ancient geometers at all, and which are not as precise as those which are found in Euclid.

The CHAIRMAN.—I think Mr. Reddie is labouring under a misapprehension as to what Mr. Byrne is doing. Professor Byrne does not wish to do away with the algebraical symbols he has used in his parallel with the Athanasian Creed. All that that parallel is intended to show is, that the greatest calls of the Athanasian Creed on our faith are not greater than what is required by what is supposed to be purely demonstrative science.

Rev. A. DE LA MARE.—In answer to Mr. Reddie, I will only at present say that what he referred to as a definition of infinity, I only used to point out that infinity was admitted in science to have an existence, although it is beyond our comprehension, and is, therefore, to that extent not "rational." And if we admit infinity in exact science, although we cannot understand or explain it, why should there be any objection to admit it also in religious matters? But you will observe that my voice has quite failed me, and therefore I must beg to be allowed to write my reply to the other criticism on my paper. (Hear, hear.)

The meeting was then adjourned.

REPLY BY MR. DE LA MARE.

IN reply to the full and free criticism made upon my paper, I beg to offer the following remarks :—First, I may observe, generally, that the design of my paper seems to have been somewhat misunderstood. I never intended it to be an essay on theological science at large, but, as its title imports, to be on theology as a science; that is, to establish theology to be a science, a truth which current pretensions go far, not only to ignore, but to deny. Hence, when Mr. Row states his preference for a metaphysical system of investigation, and Dr. Irons for the labours of the schools, I am not necessarily in conflict with either the one or the other :—I have controverted neither. I have simply passed by both in silence. If, therefore, either gentleman feels disposed to undertake the task of establishing his own position, his doing so would in no degree affect mine, unless it be held that there can be only one mode of demonstrating the same truth, which I am not prepared to admit. The track in either case has been pretty well beaten, and I may be allowed to doubt, especially after the not very remote controversy of Professor Mansel and the late Professor Goldwin Smith on "the limits of religious thought," whether the metaphysical treatment seems to be the best adapted to meet the requirements of our time; and also whether the scholastic theo-

logy, either simply revived or modernized, is most calculated to commend itself to the current methods or spirit of scientific men. Dr. Irons tells us that the science of theology from the seventh century downwards has been thoroughly inductive and truly Baconian; and some of the claims, not all, which he advances for the laboured efforts of the great men whom he cites I do not combat. He knows, however, doubtless better than myself, that this system has not always passed unchallenged, nor had it satisfied all minds, even before the Reformation; *e.g.*, Lord Herbert tells us, in his life of Henry VIII., that what especially wrought on that monarch to write against Luther was the contempt he manifested for Aquinas, the "Angelic Doctor." On the general question, therefore, I think I may safely pair off Mr. Row with Dr. Irons: the one sees in the present state of theological science nothing satisfactory; the other, a perfect theology since the seventh century. Grant either position, and it in no way invalidates the independent course taken in my paper, a method not without precedent—*maum ante me*. (See Cumberland, *De Legibus Naturæ*.)

But to come to particulars. Mr. Row demurs to my definitions and axioms: *e.g.*, "God is a spirit"; and, "God is," that is, exists. Now, with all due deference to Mr. Row, taking the truth, "God is," or, "God exists," not perhaps as the exact equivalent for, but as the New Testament phrase corresponding to, the Old Testament "I am," I contend that this is a definition, and that it expresses not merely the truth of God's existence, but the mode, —that He is self-existent. Similarly of "God is a spirit." Mr. Row says this is simply a proposition. A proposition in logic it may be; but a proposition in mathematics needs demonstration. Will Mr. Row supply the proof here? Mr. Row further demurs to the statement as to the portraiture of the Messiah supplied by the Old Scriptures, and says that it gives to the rationalist a vantage-ground. He passes by, of course unintentionally, the hypothetical form of expression used, and ignores the important word "almost," though he quotes both. But, these regarded, I am wholly at a loss to perceive the least advantage that is conceded to the rationalist. Let him seize upon and appropriate it, and what follows but that he must concede the truth of prophecy?—the last position, I conceive, which our rationalists would be content to take up or even tolerate. The lucidity of the Old Scriptures on this point rests, however, on the very highest authority. But for such clearness of statement in the Old Testament, what force had the exclamation of John Baptist possessed, "Behold the Lamb of God, that taketh away the sin of the world"? But for this clearness, why did the Lord Himself chide those who understood not, or who misunderstood, Moses and the prophets, as to the things concerning Himself? Mr. Row's closing objection to the analogical portion of my paper (and I cannot compliment him upon his own selected instance, out of "no end of such speculations," with which he enforces it,) will be best met by my reply to the more detailed and tangible criticisms of Mr. Warrington.

Mr. Warrington does not tell us whether his objections are more or less numerous than the twenty-six of Mr. Row—a full alphabet of charges—but

he intimates a general disagreement with the paper, confining his criticism to the analogies ; to these only, therefore, can I apply myself. I would remark, by the way, that the conclusion drawn from analogy not being an essential portion of my argument, but purely supplemental, it might be withdrawn without prejudice to my plan. However, let us come to the criticism. The first demurrer is as to the threefold character of the law of attraction. Mr. Warington says this is an extremely disputed point, and his conclusion is that it must be given up. Now, if *rightly* disputed and *proved* to be an error, of course it must give way. But is Mr. Warington willing to at once concede everything in science that is disputed ? I suspect not. At any rate, I am not, and till his allegation is not only mooted, but proved, the suggested analogy may stand. The next instance is the triple motion of the heavenly bodies, and Mr. Warington truly says, again, the last of the three is "disputed ;" and, if so, again we reduce the three to two. I rejoin, Not quite "if so": if so, and *proved* to be an error, and if proved not to move *through* space, proved also not to oscillate *in* space, well and good, and the analogy must be withdrawn ; but till then—till disproved, not disputed only—this too may stand. The next analogy is light ; and of the three alleged spectra, Mr. Warington says they are convertible the one into the other, being only modifications of the same force. But separate modifications of the same thing are not identities. The presence of new accidental differences or external qualities effectually forbids us to regard such modifications as identical. I await therefore the proof, not the bare assertion, that there are not really three spectra. But the mention of the luminous spectrum being compounded of three rays awakens not only Mr. Warington's surprise, but his sarcasm. "Such a fallacy, he should have thought, would by this time have vanished from every scientific mind." I submit to the correction, if correction it really be, not however quite assured that even yet we have reached the final truth. Within no very lengthened period of years the doctrine as to the luminous spectrum has passed through more than one phase. Once supposed to present seven colours, the number was subsequently limited to three. Now we are told the number exceeds all limit—"an infinite number." Are we to rest at this point ? On the analogy of atmospheric air, the criticism is both as to fact and expression. Atmospheric air, Mr. Warington tells us, is not a compound, but a mixture. Is this distinction technical, or is it solid ? If solid, I at least err in good company. Johnson says that a compound is "a mass formed by the union of many ingredients": a mixture is "a mass formed by mingled ingredients." I fully recognize the verbal or numerical difference, but I fail to perceive the exact bearing of the criticism in this place. As to the fact, the history of atmospheric air would seem to square with that of the luminous spectrum—it is variable. Originally I believe supposed to consist of only the two gases which so largely preponderate, it was afterwards considered to consist of three. Mr. Warington now tells us that the number is unlimited. Again, I ask is this our resting-place ? I would also venture to ask whether this is really the normal state of atmospheric air, or is it not its local and accidental

condition? Mr. Warington next asks, respecting water, What is there of triple constitution here? He passes over my qualifying words, "at least in respect of its accidents," the presence of which accidents, as in the case of the solar spectrum, certainly exhibits the three modifications specified, and which modifications I contend are not identities. Next, triplicity in electricity. Mr. Warington says, "I have always understood that electricity is not of three—but of two forms, positive and negative, vitreous and resinous." Granted. Some have even advanced the theory of two distinct electricities. But to look once more a little beyond the one technical use of the word "constitution," Johnson tells us that it is "a system of laws"; and again, "particular law"; and I presume the fundamental laws of electricity are admitted to be threefold—the attraction of bodies in opposite states of electricity, the repulsion of bodies in similar states, and a body in a natural state attracting bodies both positively and negatively electrified. On this head of triplicity Mr. Warington adds, "We are not told how." True: I merely stated what I believed to be the fact; and in such reticence, if I erred, I erred in good company. When Humboldt speaks of terrestrial magnetism, he simply states the truth as to its "triple elements:" his explanation, however, is elsewhere—viz., that its main character is "*expressed in the threefold manifestation of its forces*"—something very like characterizing it by its laws of operation rather than by its forms. The next instances to which Mr. Warington demurs are the threefold vital mechanism and the threefold nervous system in the human subject. He says that he utterly fails to see these points. All I can reply is, that others of the learned and honourable profession of which he is himself so eminent a member do see them; and we are only therefore in the universally acknowledged dilemma, "Who shall decide when doctors disagree?" Mr. Warington's closing criticism is upon the expressions in relation to space. He tells us that "before" is a reality, and "behind" is a reality, but "here" is a line; "and what is a line but a thing which has no extension?" Well, I had always thought that "here," as in relation to elsewhere—e.g., "before and behind"—was the space which the speaker occupied, and as palpable a reality as either of the other terms. Moreover, had I attempted to define the junction or separation of the two, I should certainly have not represented it as a "line." Taking man's standpoint *theoretically*, the extension can only be lineal, and the junction or separation only a point; but taken *practically*, and man's place is a solid, and the junction or separation must be a solid also. I marvel that Mr. Warington did not, as in the cases already noticed, suggest the unlimited theory put forth by, I think, Professor Sylvester before the Royal Society, in the form of there being n dimensions in space. When this theory is accepted, and when n dimensions, or even four dimensions, are proved, I shall be ready to withdraw the analogy. But Mr. Warington tells us that "a line has no extension." I had always understood that a line had length; and is not length extension? Mr. Warington must forgive me if I yield to the strong temptation to quote his own sarcasm:—"I should have thought that such a fallacy would by this time have vanished from every scientific

mind." Mr. Warington's argument as to a dual analogy has been amply and most fittingly answered by the Chairman, to whom I feel deeply indebted for his able reply to the various criticisms here reviewed. It can surely never be pretended that because a dual analogy is observable, therefore a triple analogy is weakened. I should feel disposed to uphold the exact contrary. One of Mr. Warington's dual analogies, as against a triple analogy, I fail to appreciate. Mr. Warington points to the animal and vegetable kingdoms ;— why omit the mineral ? For one thing I feel that I owe a debt to Mr. Warington, which I beg to acknowledge : that his entire criticism has forcibly brought to light, and most strikingly exhibited, the fundamental and constant changes which science, in almost all its branches, is undergoing in our day, and its consequent lack of at least one element, stability, so essential to any system which aims either at guiding the human intellect or recovering it from supposed errors. It has thus indirectly contributed largely to my main object—the true estimate and due location of theology as a science. I gladly quote and most heartily adopt the sentiment of our Chairman :—“ *I believe most fully that you can, even from the Bible itself, and without going to scholastic theology, take your stand upon this, that there is a scientific theology in the Word of God* ”—and I venture a further assertion. Dr. Irons, in his criticism, drew a contrast between the scholastic theology and what he termed “ popular religion.” Now, by the Doctor's own showing, the schoolmen did not begin to elaborate a scientific theology for seven hundred years. I claim for that in Scripture a priority to just that extent. If asked where I find it, I adopt the response to the taunt, “ Where was Protestantism before the Reformation ? ” and reply,—*In the Bible*. Should my paper be in any measure the means of drawing attention to the subject of which it treats, it will not have wholly failed of its object. And as our discussions I trust have for their purpose to elicit truth, not merely to exhibit critical acumen, I am quite content that I was obliged, by a temporary loss of voice, to allow judgment to go by default when the paper was read ; and acknowledge with thanks the courtesy of the Council in allowing me to offer these remarks in writing.

ORDINARY MEETING, APRIL 6, 1868.

CAPT. E. G. FISHBOURNE, R.N., C.B., HON. TREASURER,
IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed.

The SECRETARY, in the absence of the Author, then read the following paper:—

*ON THE IMMEDIATE DERIVATION OF PHYSICAL
SCIENCE FROM THE FIRST GREAT CAUSE.* By
RICHARD LAMING, Esq., M.R.C.S.

IF I can show how, according to human notions of possibility, matter may have been formed out of nothing, and that the laws of matter, as we learn them from practical observation, involve the necessity of a superintending intellect for maintaining them perpetually without change, something will have been done towards reconciling the Scriptural announcement of a Creator to the minds of philosophers of every shade of opinion. And if I further show that the fixedness of the physical laws, and the uniformity of their operation, are compatible with variety in events, the unbeliever in Revelation will no longer be able to require the praying Christian to prove the laws of Nature to be variable, or their operation subject to change, as a condition necessary to moral government. To do these things is within the reach of human reason; and by a means that will more intimately relate the sciences to one another and dissipate much of their complexity. It is, besides, of no little import that the argument made use of is at its very first step as thoroughly theological as it is natural,—a combination which it continues to exhibit for ever afterwards. This twofold character it owes to its foundation on an obvious truth, which alone makes it to differ widely from arguments starting out from experimental observations about which we must always be more or less in doubt. That truth, too, is universal in its character; and thus the conclusions deduced from it have no limited applicability, but comprehend from the first all physical sciences, instead of being restricted to the one upon which we may have made an induction from experience. All this, however, the argument will better explain for itself,

as we allow ourselves to be carried from one to another of its conclusions.

Suspending our reliance on Scriptural authority, except in so far as to assume the existence of God as set forth for our belief, let us see whether we can, as natural philosophers, understand *how He made the material world out of nothing*. This is the truth from which I start.

I begin by remarking that the only *nothing* it is possible for me to conceive is empty space, which I think of as boundless in extent, eternal in endurance, but—with respect to entity—uncreated and absolutely nothing. Now, God is described as *ever filling* all space; for which we can conceive the qualification to be His boundlessness and eternal existence. Whenever, then, we observe created things to be in space we must conclude that they are, together with ourselves literally, also *in Him*; but to receive this at the hand of reason with all the satisfaction which truth should confer needs some little preparation. That matter can exist in space—which we should be inexact in calling an immaterial thing, as it is a simple negation of *all* things, whether material or immaterial—is easy to be understood; but to believe matter to be received into *intellect* or spirit is an incongruity so long as we look upon matter as we now do. We cannot imagine any mind to be tenanted by the actual hard solids of Newton's system. If, then, the creation be in God, we must prepare to believe it to be only a mental conception, however real and material it may seem to us; and that seeming reality we must account for.

These considerations suggest a way in which the creation of material things may possibly have taken place. Mind is capable of forming and entertaining geometrical conceptions; and there is no difficulty in concluding the power of the Almighty to be limited only by His will. Now, men have minds, and each can form conceptions—it may be of small geometrical spheres, which it truly imagines to be within itself in space. Those spheres may be conceived to be either distinctly separate, or to so intersect one another that any number of them may be more or less compounded with each one. As in the case of our own mind at every instant to a finite extent, so the mind of God at the creation can be imagined to have occupied itself to an infinite extent with first conceiving such immaterial spheres, and then, with a sovereignty entirely His own, *commanding them never to penetrate or intersect one another, even in thought*. That irresistible command, which no creature has the power to issue or to question, would to all intents and purposes convert the geometrical spheres instantaneously into the hard resisting matter of Newton, existing as *a conception in*

the mind of God, just as they had done while purely geometrical in character. How well are thus united the opposite systems of Newton and Berkeley, so far as integrity of volume is concerned, I need not stay to point out; but it may be well to say that their reconciliation in minute details is provided for on principles equally perspicuous.

Created matter is, on this showing, still immaterial to all immaterial things, which have no bounding surfaces for them to rest against; and materially solid to all material things which have such surfaces. From this it follows that things are not what they are in themselves absolutely, but rather what they are in relation to something else. Now, when we duly extend this *consequence of relation*, we perceive other truths, among which I shall hope some day, if spared to undertake the task, to enlarge upon the following physiological doctrine:—Mental perceptions of the relations of material things to organs of sense are immaterial, because the perceptions are things which relate only to immaterial mind. And almost immediately I shall have to prove that on this doctrine of *relationship* hangs the whole explanation of cause and effect throughout the length and breadth of all the natural sciences.

The change of geometrical solids into material solids takes date from the act of mental volition to which the change is due. Up to that moment the thing which has been created geometrically, and which is still immaterial, is susceptible of infinite division; but at that instant of becoming material with relation to all similar things, its divisibility, on these principles, ceases, and it remains for ever after a *definite atom*, greater or less in volume, but to our minds always inconceivably minute.

The atoms of matter *thus constituted* have only *form, volume, and physical solidity*, without any means of changing their places in space, either to collect together or to disperse; but Omnipotent volition is competent to invest them with a tendency to approach one another from any distance, which tendency we should call attraction, meaning, by the term, some power calculated to lessen distance between their bounding surfaces. Now, geometrical spheres have no such tendency, while atoms are reciprocally attracted. *Attraction, therefore, must start into existence AT THE MOMENT WHEN the geometrical solids become atoms*; and whether we call that force immaterial in relation to its source, or physical in relation to its results, it is just the same an operation of Divine volition. We have seen that the geometrical solids become definite in volume at the instant of changing into material

atoms ; just so, then, we must conceive their force of attraction, and its laws, to be determined at the moment when volition lays aside its distinguishing characteristic to appear as physical. The importance of epochs cannot, for the purposes of this essay, be overrated ; we shall not fully comprehend that importance until we come to treat particularly of force, which, by means of its laws, I shall be able to refer unmistakably to a power exercising both will and intelligence. But I must first call attention to some other uses in the marking of time, by which we may prepare ourselves for what is to follow.

Observation has familiarized us with the force of attraction. Attraction in atoms, when not counterbalancing itself in opposite directions, gives rise to motion ; and motion of the atoms attracted is not only a physical event, but the only event attraction can immediately occasion. It may be objected that the mind cannot conceive spaces, say small geometrical spheres, to change their places ; but that is no difficulty, as it is quite conceivable that the Omnipotent volition, which gives to spaces material solidity, can transfer their solidity to similar spaces in a linear direction, and thus, in effect, cause the atoms of matter to move towards one another.

Physical events, material facts, or natural phenomena, by whatever name they may be called, are matter in motion—some relative position of things which *has been* changing into that which *is*. Now, it is of the utmost importance to observe that all physical events, without exception, whenever and in whatever part of space they may occur, must be related to each other by *time* and *place* ; that is to say, either by co-existence or antecedence, and by relative position. In the present, as in the past, space is replete with events to which it would be impossible to deny the relations of time and place. And, on the other hand, it is equally obvious that to those relations alone no effect can be ascribed, for they can produce no motion in which only physical events can originate ; they are insufficient to change one event into any other.

Among physical events there are some which follow certain others with an invariableness not to be explained by the relations of time and place, and about which the mind is conscious that it perceives something more than orderly sequence. It perceives in the uniformity which marks their successions the necessity of a third relation to occasion what the first two relations cannot effect ; some influence connecting consecutive events by an action which cannot be questioned, without first admitting that invariable uniformity can result from no cause, and which of course we cannot assent to. Whatever be the

nature of that influence, the relation we are now speaking of as the third must therefore be admitted to be as palpable to reason as the other two ; and we call it *force*.

Of the three relations, time, place, and force, one of them—namely, *time*—never has a constant identity. Time is incessantly changing ; but inasmuch as in passing away it substitutes a reproduction of itself, the change in identity virtually leaves the relation of time unaltered. The second relation, *place*, can only be disturbed by motion, which, however slight, changes one event by substituting another. If motion in the things related could be an accidental occurrence, we might have new events by accident ; but as that cannot be, the system of nature would, if there were only two relations of time and place, be a perpetual reign of unbroken sameness. It is only by the production of motion by the third relation, *force*, that its associates, time and place, have any influence in causing physical events ; otherwise impotent, they are thereby, as I have said, made productive. Force inseparably appertains to the materials whose relations to one another *cause* events by undergoing change. Consequently we have, as the cause of events, not force alone, nor place alone, nor time alone, *but all three together*, each determining by its existing relation to the materials what the influence on them shall be ; there must be force to act on them, time must have the relation of being present, and place must determine what depends upon relative position.

At this point the system I am describing furnishes a truth most extensively borne out by observation—namely, that *if we neglect the ideas of antecedence and subsequence*, the expressions *cause and effect* become interchangeable, because all the relations between them, with the exception of time, are minutely reciprocal and equally consequential in one direction as in the other, by which is shown the necessity of taking the relation of time into consideration. Cause must in some slight measure occur before its effect, and so far one is different from the other ; but during the time that they co-exist *each is the cause of the other*. Attraction may possibly move the effect towards its cause, or the cause towards its effect ; or the two may be moved simultaneously ; and, however slight the change of place may be in either, the movement will be productive of a new event, or fact, each originating its own series of consequences. For want of recognizing the several elements of cause, physical science has been involved in serious mistakes, being made responsible for what mechanical writers call accelerating forces, entirely unknown to nature ; for when moral power takes upon itself to become physical, it

assumes the new character only by becoming definite in its action, with which the idea of acceleration is utterly incompatible. When force, at consecutive times, or with variable relations of place, acts with variable intensities, determined by a law of time or of distance, it is the practice to merge all the events in one, and to impute them to a force of some peculiar nature rather than to force acting as distinct causes. Such a force is the gravitation of mechanical science.

Cause and effect, each as a whole, are necessarily equal in all cases; whether a cause involve one or several forces, and whether it concentrate its effect on a single event or many.

The triplicated cause of effect, according to this system, may be immediate, or remote. It is immediate, when the term cause is applied to the relations which unite it to its effect without the occurrence of any intermediate events; and remote, when applied to relations no longer existing, but which have established subsequent and intervening ones. Cause may thus be more or less remote, extending back through any period; and it may be also, when immediate, more or less *continuous*, the time changing in its *identity*, but all the three relations remaining constant.

The existence of these several relations being understood as explanatory of the observed sequences of cause and effect, and there being in the relations of time and place nothing further that needs to be here noticed, I wish to direct inquiry more particularly to the relation—force. Now, without assuming any further knowledge of force than has been given in speaking of attraction generally, but proceeding to judge of it as required by the exhibition it makes of itself, we have only to contemplate the immense variety of material events, for each one of which force is an element of cause, to feel assured it must be less multitudinous in its kinds than they are. But, on the other hand, observation will not justify us in ascribing all effects to a single force; which in that case would have to be rendered into distinct causes merely by diversities in the relations of time and place. We might, it is true, under the relation of place, extend our conceptions to *position*, and thus include much that would not be involved in the idea of *distance*—indeed to position I have to attribute much; but no view we might take of the events which science has classed under distinct branches of physical knowledge would enable us to suspect there were not some essential differences between the forces of gravitation, electricity, and heat, which all the world acknowledges to be perfectly distinct at least up to that point—sufficient for my present purpose—at which one is supposed by way of “cor-

relation," to pass into another. By the operation of these three varieties of force, each acting in its own particular way on atoms of matter, and under the conceivable varieties in the relation of place, we shall have a great diversity of causes, though we repudiate all other alleged forces implicated in magnetism, chemistry, physiology, and light, of the separate identity of which we have no positive evidence, and as it seems to me no need.

The forces of gravitation, electricity, and caloric, or heat, are each so common that we may consider them to be acting in concert in insensible spaces intervening between the atoms in masses of matter. What their several actions are is not of moment in the present state of our argument; it cannot be doubted that each action is peculiar to the force to which it belongs, nor that the consequence of each at any time varies with the relation of place. In the interstitial spaces the action of each force will be distributed probably among many reactions, reducing effects to greater minuteness, while increasing them in number, to operate as causes in the next ensuing stage of the physical operation.

I would point here to an instructive metaphor, illustrating the production of physical events by the reciprocal relations of causes and effects, to be found in the formation of language. Consonants may be likened to the atoms to be related at any particular time; vowels to the forces which relate them; and the varied sounds of each vowel to the forces under the different relations of place. Consonants with a certain modification of vowel-sound, make up a definite syllable; so atoms, combined by certain forces and relations, constitute a certain material thing. And just as two syllables will not result from the same orthography and orthoepy, so a sameness of physical cause, or in other words, sameness of force with sameness of place, cannot produce two facts.

We thus arrive at sufficient knowledge of the fundamental principles of physical nature to perceive a distinction between *Cause* and *Force* which seems to have been lost sight of. We have been putting one for the other by philosophizing as though force governed by laws irrespective of the relation of place, were the same thing as *Cause having the relation of place involved in its constitution*. We have made the mistake of supposing that all which is true of cause, remains true when we substitute for it its two elements, force and time, omitting its important element, place. The *laws of force*, like all the other truths of Nature, are invariable; not so the action of force between cause and effect, which we know by observation is determined by their relative positions, often

subject to modifications at the suggestion of even human volition. Those modifications being made, it is a law of Nature that the action of force shall adapt itself to the circumstances; leaving the rigidity of the laws of force *under constant circumstances*, perfectly uninvaded. With *changeable causes* it is therefore puerile to insist upon *unchangeable effects*, merely on the plea that Nature's laws are inexorable; nor can law determine for the future what events shall occur at any time, when they must depend upon causes that may be determined, so far as their element place is concerned, independently of the laws of physics.

As events depend upon the relations existing between cause and effect, and these relations are altered by motion, events will often result from material organizations, whether endowed with intellect or not. Mind multiplies and modifies events by its volitions. The agriculturist multiplies organizations, and consequently modifications of motion, by sowing and planting; the chemist, by changes in place, produces changes in things; the physician, by new relative positions, supersedes pestilence by health; and every one *moves* to intercept events which otherwise would happen. At one time we secure the repetition or avoidance of an event of which we have learned the conditions; or, when experience has served us less well, we empirically trust to probability for obtaining a desirable event. And, assuredly, we may carry the same mode of determining events up to a higher intelligence than our own. If we, and in its measure, every lower intelligence, can at the dictate of personal *will*, work changes in events, knowingly or unknowingly, then a power in the Creator of us and them to do the same thing, cannot be questioned; to doubt this would be to imagine the *command* He has given to our own minds over the matter so mysteriously associated with them in our persons, wanting between His own mind and the universe of matter to which He is so intimately united.

From whence, then, is scepticism to obtain reasonable justification for its charge against praying Christians of ignorance and presumption, when they, putting their shoulder to the wheel to roll away a pressing evil, find the task beyond their powers? Christians know that converts to their faith are not to be made by physical evidences; still, science may remove many a stumbling-block out of the way; and there will be one the fewer if the distinction now pointed out between force and cause lead to its being perceived that variation in effect is not incompatible with invariability of law.

In the foregoing pages I have connected causes and effects by their mutual relations with respect to force, time, and place. Force has appeared as an attraction tending to shorten distance between cause and effect, every motion it produces in accomplishing that end substituting for the old a new state of things, which is a new fact, a new phenomenon, or a new event. I have presented only three kinds of attraction—the electrical, the gravitating, and the calorific; each acting simultaneously with the others and producing the whole variety of physical nature. Time has marked the relations of force and place reciprocally to one another, all which are epitomized in the laws of force. The relation of place between cause and effect has been shown to change with the motion produced by force, sometimes put into operation at the instigation of intellect either human or divine. And as a result of all this, while elucidating the fundamental principles of nature, and pointing to the intervention of man in the rigid operations of the universe, his appeal in faith to an intellect superior to his own in knowledge and power has been justified for doing without any interference with established laws, things of which he himself is incapable.

Of far greater interest to man than the composition of cause and the operation of force, is the *nature* of force. By believers and sceptics alike, with very rare exceptions, physical force is regarded as something inherent to matter for its government, either placed in it once for all at the creation, or as the Atheists suppose, existing in it from all eternity: a something which can be distinguished from moral force even by those who admit its derivation from it. I have already referred to its origin by saying how moral force could assume to be physical, and at what epoch it was necessary the change should be made. It is impossible to conceive the creative mind to have made the rudimental matter of the universe, and to have left it an instant without forces and laws. What further knowledge we require we obtain from experience. We observe that the laws of its forces are unchangeable, by which we distinguish the physical from the moral. In reality it is moral still, moral volition assuming to act without any variableness from the plan fixed upon for the creation. Our own personal experience furnishes us with evidence that this is the true distinction to be recognized between the moral and the physical Forces; for we change our moral volition into physical force. In making the change we can even determine up to a certain limit what the magnitude and laws of the

force shall be. The empire over which our moral power has this command extends however no further than to our own persons. Man's mind wishes to raise say any weight not exceeding the limit which has been assigned him, and his will—commanding a material organization constructed for obedience to it in some manner to us unknown—calls into operation an amount of physical force suited to the work the moral power requires to be done, neither more nor less; for, *if the will be so*, the weight is steadily suspended, becoming no more than balanced however much it may be reduced in magnitude, the physical force, mysteriously put in operation within the material organism at the dictation of the moral volition, being, in every case, precisely equal to the external physical resistance to which it is required to act in opposition. *How* the mind acts upon the material is no more a mystery, nor less a fact, than the action of one mind upon another; we know both, we can comprehend neither.

By this experience of our finite moral power, simply expanded to comprehend the infinite case of the Divine practice, I think we may understand on what principles the work of creation and preservation proceeds. Physical force, as I have conceived it, is none other than moral power acting—not on mind only but also on matter as well; and, in the case of God, uniformly with an intensity of force previously determined, and subject to laws which this system takes into account under the relations of place and time.

To estimate the competence of this view of *the nature of force* to get us over the difficulties of physical science we must submit the force to measurement, which its definite nature enables us to do. We measure different magnitudes of the same physical attraction relatively to one another by comparing them under like relations of place. Unlike physical attractions may also be estimated by comparison with one another. Moral forces are unsusceptible of relative admeasurement; and as all forces are originally moral, those which we compare and measure must, as I have before said, have passed from the moral into the physical character; *after which*, if a physical force be, under given relations, equal to another physical force, it cannot, under the same relations, be unequal to the same force. But when the relation of place is changed, every measurable force practically becomes greater, or lesser, as it operates at a lesser or greater distance, the force, as we observe it, varying inversely in the duplicate ratio of the distance. Now, it is by taking that law into account, under the relation of place, that *causes and effects are made equal, while the absolute forces implicated are at the time un-*

equal. This inequality of force at variable distances puts a negative on the possibility of what is called the *conservation of force*; and, of course, on its dependent doctrine of the *correlation of physical forces*, about which I shall have presently more to say.

The Divine Mind, having determined what shall be permanently the *absolute force* of the several attractions, will in each case have adopted *the law for varying its action* which has been foreseen to be necessary *for the universe as it is*. He might have established for distance between cause and effect any ratio other than that of the inverse square; or even the law might have embodied some other command with which distance had nothing whatever to do. Thus while, as we know, it has been established that two masses of matter gravitate between cause and effect through a given distance with twice the force of one of them; we are unable to perceive any reason why the gravitation should not have become on the coalescence of two equal masses, *and by reason of it*, four, or any number of times, instead of only twice as great. Of course, as a unit of matter gravitates with a unit of force, two similar units of force under the same relation of distance must—being entirely independent of one another—have a force of gravitation exactly twice as great; but *who can discern any necessity for the existing independence?* Dependence, or independence, is determined by the volition in exercise, and volition is subject to no necessity. Until we discovered by observation what moral power *had* elected to do, the existence of any one law, or ratio, between force and matter could no more be anticipated by us than any other law or ratio; and for those in nature we are without a reason, unless we find it in this—that the laws in operation are what they are because none other would have produced things as we actually find them, and as we can have no doubt they were intended to be.

But it is plain that if the coalescence of a double quantity of matter in action had exhibited a four-fold force, the ratio would certainly not have furnished a warrant for regarding, as it is the common practice to do, matter and force as the simple measures of one another. It would have been as easy then as it is at present to ascertain the quantities of ponderable matter corresponding to amounts of gravitating force; and we should have observed that they varied otherwise than in a simple ratio with one another. Now, although that is not the case with gravitation, it may be the case with one or other of the attractions, which we cannot know to be alike either in their laws or in their absolute forces, unless we learn it from observation; and observation teaches us a very different fact, as

I pointed out in the *Philosophical Magazine* so long ago as June, 1838, and have since leisurely and fully verified. The science of electricity is in a very anomalous condition, from which this system seems appointed to extricate it. In the latter part of the last century experiments were made by the Hon. H. Cavendish, and since that time by Sir W. S. Harris, over which both those philosophers abstained from theorizing, for the simple reason that neither of them could comprehend how it was that while electricity only doubled in quantity, the force with which it acted increased in the duplicate ratio. This truth it first fell to my lot to naturalize, and it is now so well known *as a fact* as to be generally received without question, although *as a law* it is still held to be an anomaly. The late Sir W. S. Harris, accustomed to treat forces as causes, and finding them in electrical cases to be *unequal* to the observed effects, put electrical forces through an imaginary "reverberation" to magnify them; and a contemporary mathematician still multiplies the electrical forces "*as in opposite mirrors*" under the same necessity. Strange physical principles these to adopt, and with no better end than to perpetuate our intellectual blindness! As we are now reading physics, the simple explanation lies in the appointment of the duplicate ratio of intensity by the moral volition; after which only can the measurable effects have measurable causes to be compared with. It was before noticed that distance causes force to vary in its effect; and now we witness the electrical attraction a second time varying, not in its effect by reason of distance as before, but in absolute intensity, because of variations in the *quantity of electricity*. A double and a triple quantity, the distance being given, acting with four times and nine times the force; a result which it is impossible we can conceive to come from anywhere but direct from the Creator's mind, and for which we shall learn abundant reason when we look into the phenomena of nature. Now, if these evidences prove anything at all, *they must prove a distinction between electricity and electrical force*; for one and the same thing cannot vary in different ratios. How unfortunate, then, was Faraday, when he worked only with forces, throwing overboard the matter of electricity, because he found it embarrassing. And how deplorable is now the position of his followers to whom he could only bequeath despair as a reward for their only too unquestioning discipleship!

If electricians were left alone with electricity, I have no doubt the requisite elements of the science would soon be acknowledged and restored; but, unfortunately, its destinies are wielded by other philosophers from whom we have no

reason to expect the speedy restitution of electrical materiality. They require for their own views that electricity shall be nothing but force, nor must there be in their system of physics any matter of heat; the forces of electricity and heat being, according to them, only phases of motion, a doctrine which it devolves upon me to characterize as, according to my view, a transparent and absurd fallacy. I will do it as briefly as I can.

"Conservation of force" has lately become "conservation of energy," it being too evident that force is subject to variations. *Energy* is now put forward in its place; and its *conservation* dignified as the "one great law of nature." In laying a foundation for the doctrine of invariable energy, its partisans set out with asserting that *force is lost if it produce no motion*. It will be safer to state what I require to say, as much as possible in their own words; after truly asserting that "in general, force is defined as that which produces or tends to produce motion," they add, "now, if no motion be produced, the force which may have been exerted is absolutely lost." Nothing can be more illogical than that conclusion; for, by the definition, force may *tend to produce* motion without producing it; and tending to produce motion has in physics no signification whatever, unless it means *acting* with a tendency to produce motion in opposition to some more powerful reaction which is rendering the action of the force—not inoperative, but inadequate. Now, *force in action cannot be said to be physically lost*; or all the static forces in the universe would be absolutely lost, although actually occupied in quietly resisting and balancing one another. How pregnant with importance is the import of a word! Had not a mechanical meaning of the term *tendency* been substituted for the physical one, no one would have been so simple as to ask in their disdain, "What becomes of the enormous force with which the earth continuously attracts a mountain, or that with which the sun attracts the earth?" They would have perceived that nothing becomes of it; but that the force, in continuously attracting, *continuously exists*; and consequently never becomes lost. Do not the questioners perceive that they are seeking for mechanical utilitarianism under the word *work*? "We do no work, however much we may fatigue ourselves, if we try to lift a ton from the ground. If we try to lift a hundredweight, we can raise it a few feet, and have then done work." In physics *effect* is work; and is there no *work* done—no effect—when the static pressure of the ton is reduced by the lifting force to nineteen hundredweight? Is the force which is capable of lifting the one

hundredweight lost because the ton of which it is part is not put into motion? The error lies in that begging of the whole question which makes work to consist of motion; but that utilitarian idea will hardly be mistaken by physicists for the *work* which science takes into account under the calculations of action and reaction.

Force, then, operating physically at a constant distance, is never lost, as those who teach the "conservation of energy" assert that it can be; nor is the immunity from loss under those particular circumstances, by any means "conservation of force,"—a doctrine which requires the total amount of force existing in the universe, under some one of many alleged forms, to be never greater, nor less, at one time than at another; whereas we know, in the case of gravity for example, that by the law of distance the downward force of a ton's weight at the earth's surface would become gradually lessened as its distance from the earth was made greater. The same also with other forces of matter; experience teaches that one and the same quantity of electricity varies very palpably in absolute force under unchanging relations of time and place, according as it may be acting alone or in concert with other similar quantities.

So far as force is concerned, it is plain, then, that it cannot be conserved, though not for the reason alleged by the partisans of conservation. Those philosophers, believing in the loss of force, and requiring something that will remain always the same in amount, give force a new name; and, calling it energy, admit under that appellation only such dynamic, or unbalanced forces as are capable of producing motion; but the doctrine is not made by the limitation any the more consistent with truth. Of the distinction thus introduced, I reason as follows: All force, whether under its proper name, or that of energy, *tends* to produce motion, and force is either in a static or a dynamic condition. In the static condition force, tending to produce motion, is counter-balanced, though still existing, but being counter-balanced, produces no motion. In the dynamic condition, force actually produces motion, and ends in becoming static by establishing an equivalence of reaction.

Now, inasmuch as motions end with the expiration of the dynamic condition on which motion depends, energy, which is only a new name for that condition, cannot be a continuation or phase of motion. And to the above there is to be added this positive denial of the doctrine of conservation: Motion cannot be a phase of force, for if it were so, force should invariably become greater when motion ceased, whereas it

sometimes becomes less, as we always find when the motion increases the distance at which the force is acting. Again : Motion is alleged to change into heat, but to produce heat is to establish dynamic force, whereas to produce motion, which is alleged to be correlative to heat, is to change dynamic into static force. Besides which the allegation violates an axiom by imputing to a single cause two effects, each equal to itself; for it imputes to motion heat on the one hand equal to the motion, and on the other, physical reaction equal to the energy which has caused the motion. And, finally, we may reason thus, on analogy : If electrical force be distinct from electrical matter, then it is not likely that heat is a force, while caloric is only an imaginary material; in denial of the long and almost universally prevailing belief that heat is a force consequent upon the operation of a material caloric.

Let me close this argument in disproof of the alleged constancy of energy or force under any form whatever, by citing a fact which has now become very commonplace; and must either be explained away in some manner which no one has been able to suggest during thirty years, or be received as settling the question for ever. Adopting the language in use, the *energy* accumulated in a horizontal disc weighing one pound raised one foot above any resting-place paralled with it would be a *foot-pound*. If, instead of the gravitation of the disc, there were substituted an equal downward pressure by electrical charge, the *potential energy*, as some call it, would still be one foot-pound. Suppose now half the electrical charge to be withdrawn; this, on the conservation theory, should reduce the downward pressure to *one half of a foot-pound*, but practically it makes the foot-pound only a quarter of a foot-pound; where then is the other quarter of a foot-pound if "energy can never be lost"?

With difficulties insuperable as these opposing the doctrine of "conservation," and with a problematical immateriality of electricity and heat for its foundation; we may well think out of place the flippancy with which the general views of heat, while they are acknowledged to have been long "believed in, written about, and taught all over the world," have lately been ridiculed, as "the pleasant fiction called Caloric;" by writers, who, seemingly without a misgiving, can thus complain that their own mechanical and utilitarian speculations are not adopted by physicists as infallible guides: "no one who knows the present state of science can ignore the fact that many of its most certain truths are still misunderstood, and their very opposites often taught, even by men who by their position or their notoriety are supposed by the public to

be among the best informed." If those writers know the present state of electricity, as men so confident ought to do—electricity being at the root of all physical science—the question irresistibly suggests itself, whether any better illustrations than themselves can be found of the literal propriety of their own satire? One conclusion is, at all events, inevitable, they are reduced to the necessity either of ignoring the new and universally required law of electrical force, now shown to be feasible, or abandoning the doctrine of conservation as absolutely untenable, letting the dependent "correlation of forces" sink to a mere relation of action and reaction, in which either of them is made to counterbalance any of the others. If the physical attractions cannot be *conserved*, there is, of course, no need of one changing into another to account for its diminution; and it is quite satisfactory to conceive that each is produced in its required magnitude under any present circumstances as a result of the moral operation of the Deity, capable of seeing the end from the beginning, and of preparing by the physical laws for every eventuality.

Reverting to the common nature I have attributed to mind, am I chargeable with straining analogy too far in adducing, as I have done, a creature, albeit the most dignified that observation has made known to man—man himself, to portray in humble degree the moral likeness of his Great Creator? I think not; when I contemplate what man can accomplish with respect to the material universe by his finite mental powers to conceive, to will, and to achieve, I perceive that those powers need only to be infinitely magnified to become identical with some of those displayed in the character of the Creator. And in the light of human reason there can be nothing irreverent in believing that the Deity has delegated certain of His mental attributes to subordinate beings, seeing that none of His creatures *have any existence out of Himself*, notwithstanding He has gifted them with a conscious individuality. Our very persons and powers are to all intents and purposes still His, for all we have is in Him, and apart from Him we are absolutely nothing; in Him we move and act. And though it appertains only to a mind with infinite power as well as sufficient intellect to will geometrical solids into material atoms—though the Divinity has restricted the operation of our volition, so far as matter is concerned, to certain parts of our own individualities placed by Him under our command for that purpose, we are enabled at our own physical risk and moral responsibility to exercise to an extent appointed by Himself, the godlike attribute of modifying and beautifying nature. This is hardly the place to say so, but

the Creator and Preserver seems to have willed that nature shall be beautiful; impressing universal mind, when unendowed with reason great enough for its appointed work, with conclusions from His own reasoning communicated to His creatures under the name of instinct—one acts blindly upon a conclusion, the other knows why, having worked it out.

In taking this view of the creation and preservation of the universe, there will arise no misconception if we call force physical by reason of the material work done by it; and even if we speak of it as being inherent in matter, since it is from one atom of matter to another that force must be measured. And we shall understand both from the moral nature of force and from what has been said with respect to the relation of place that force operates through indefinite distances; now, as it is impossible to imagine the moral command of God to be bounded by any limit, we can dispense with the necessity for filling up the inter-planetary spaces with an all-pervading ether in deference to the allegation that "matter cannot act where it is not." We cannot allege the same thing of mind; and if we could, the mind of God would be everywhere in space. Nor can we imagine matter, as a creation of mind, to be capable of any performance impossible to the mind itself from which it was derived.

In conducting this argument no allusion has been made to *repulsion*, for the simple reason that no such force is required. What we call repulsion is not a force, but a fact due to attraction. A universal attraction of a material caloric or a material electricity among the atoms of matter is quite enough to separate them. It will remain for future efforts to trace these principles into special sciences; by affording which, and scattering light upon details, they will, as I have spent some years in ascertaining, exhibit the best proof possible of their own truthful derivation. To simplify a science is a sure way to advance it; but this does not mean either to cripple it, or to adopt into it mere mechanical expedients; while to advance the physical sciences as a whole demands the discovery of principles claimed by them all in common. If this system be true, it will, when the attempt is made, merge more or less in one another what are now regarded as distinct specialities; and so much I can promise for it that it can do.

In conclusion: this system of physics, although worked out on physical principles, conforms to the teaching of Revelation. The First Great Cause, who provided that word-pictures of His own Character should be displayed

for the foundation of man's faith in His existence, power, and goodness, has, for its corroboration, coupled with their exhibition the testimony of physical science. He has put it into our power to *know* by induction much which it would perhaps please Him better that we should be morally qualified to *believe*. For some purpose approved by His universal perfection—perhaps to put honour upon child-like confidence and trust—He has given Revelation to do for us what in the pride of reason we imagine it would be more dignified to do for ourselves; we would by the light of argument “see the print of the nails,” and by our own mental acumen put our “finger into the print of the nails,” and thus be sure that in crediting testimony we are not submitting to delusion. Well; to all is not given the same gift, and the best gift is not always that of our own choosing. He can only choose best who knows best; he knows the best whose experience is the least limited; and he cannot be said to have the most extensive experience who studies in the mind of God nothing but His intellectual Power.

The CHAIRMAN.—I have to ask you to give a vote of thanks to the author of the paper, and to invite discussion upon the views it contains.

Rev. C. A. Row.—I have given great attention to the matters discussed in the earlier or metaphysical portion of this paper, and I purpose to confine my remarks entirely to them. I am sorry that the author is absent, for I came prepared to ask him many questions, to which I should have been glad to hear some reply; for, though I have studied metaphysics for many years, I find in this paper many things to which I am altogether unable to assign any definite meaning. Some of the statements I cannot believe the author means me to accept in the ordinary sense as they stand. The fact is, he has entered upon the whole range of ancient philosophy, beginning with Thales and ending with Aristotle; and before you can consider any of those points which he has laid down as proved, you must discuss the whole ancient philosophy in its metaphysical character. When you read the old authors,—and let me take Plato as an example,—you find in many of the dialogues which enter into these subjects conclusions in which nothing is concluded. And there are many points in this paper, also belonging to ancient philosophy, which are quite beyond any of the powers of the human mind. Macaulay, in his essay on Lord Bacon, gives us an illustration of this, when he observes that Plato had a first-rate bow and a first-rate arrow, but, instead of going out to shoot mundane things, he tried to shoot the stars. Now, that, it seems to me, would apply to some of the observations in this paper. Mr. Laming says:—

“I begin by remarking that the only *nothing* it is possible for me to conceive is empty space, which I think of as boundless in extent, eternal in endurance.”

Now, Lewes, in his *History of Ancient Philosophy*, or Grote, in his *Plato*—I forget which—has observed, with great truth, that one fundamental error, lying at the root of these reasonings, is the assumption of “Nothing” as being an absolute entity—that nothing actually exists as nothing—and I quite believe that other observations founded upon that assumption lead to a vast amount of error in reasoning, and to endless inconclusiveness. I apprehend the author has fallen into exactly the same error as that which either Lewes or Grote charges against a number of these old metaphysical speculations, whether of the Ionic or of the Attic school,—in Plato’s *Dialogues*, and even in Aristotle’s *Metaphysics*. Now, according to Mr. Laming, in the passage I have read, empty space is nothing; but immediately afterwards he assumes it to be something. When the old Greek philosophers predicated a thing as non-existent, they predicated its non-existence as existing, according to Mr. Lewes’s view; and I think the same thing has been done here in the predication of the existence of nothingness—

MR. REDDIE.—I think Mr. Laming means the opposite, whatever construction his actual words may bear.

MR. ROW.—Then what does he apprehend space to be? Space, to my mind, is not an actually existing thing, but simply a subjective thing. It is a matter of very deep and important philosophical speculation; and it is impossible to say that it can be assumed as determined. Mr. Laming goes on:—

“Now, God is described as *ever filling* all space; for which we can conceive the qualification to be His boundlessness and eternal existence.”

Here we have space presented to us as actual extension, and then God is described as filling all space. Bear in mind that I am speaking in philosophical and not in popular language. Of course it is correct in popular language to say that God fills all space; but, philosophically, if space is extension, and God fills all space, it gives the idea of extension to God Himself. These are matters which are quite beyond the limits of the human understanding. The nearest approximation we can get is to say, not that God fills all space, but that He is present at every point of space in all His uncreated perfections. It is impossible to say that God fills all space without giving direct and positive extension to Deity. Mr. Laming proceeds to say:—

“Whenever, then, we observe created things to be in space, we must conclude that they are, together with ourselves, literally also *in Him*.”

Of course, if the Deity has extension, and all created and finite things are also in extension, it will follow that all finite things are contained in Him. The real difficulty of the whole subject, and that which the author endeavours to unravel, is how the Infinite has created the finite. But that is a difficulty which we cannot grapple with. The *modus* in which the Deity—the uncreated God—has actually evolved finite existence, is beyond all human conception.

Mr. Laming lays it down, then, that all created things exist in God, and he goes on to say:—

“That matter can exist in space—which we should be inexact in calling an immaterial thing, as it is a simple negation of *all* things, whether material or immaterial—is easy to be understood.”

Here is a great peculiarity. I cannot understand how space is “a simple negation of all things,” viewing it as a negation:—

“But to believe matter to be received into *intellect* or spirit is an incongruity, so long as we look upon matter as we now do.”

This language seems to me to assign extension to spirit. “Matter to be received into spirit” makes extension an attribute of spirit; whereas, according to my conception, the idea of spirit involves the negation of extension. We cannot get an idea of spirit if we attach extension to it. But here is something still more surprising:—

“We cannot imagine any mind to be tenanted by the actual hard solids of Newton’s system.”

I certainly cannot understand this desk getting into my mind, for instance. Of course the idea of it is in my mind, but that the actual desk itself should get there I cannot comprehend—

The CHAIRMAN.—It would be very inconvenient if it did. (Laughter.)

Mr. Row.—Mr. Laming goes on; and this is the surprising part:—

“If, then, the creation be in God, we must prepare to believe it to be only a mental conception, however real and material it may seem to us; and that seeming reality we must account for.”

Now, this is very serious. We come at once to the theory of Berkeley and a vast number of previous philosophers—among the Greeks of the pre-Socratic school—who deny the existence of the material universe. Considerable portions of the Platonic system are also founded on the same principle. There are certainly very powerful reasons to be urged against the existence of a material universe; but, in spite of all the reasoning of Berkeley and others—in spite of all that may be found in Plato—I believe there is a material something in those objects which I see around me, and behind and above all the conceptions of those things which I have within the limits of my own mind. I do not deny the weight of the reasoning against this; but, in spite of all the arguments, I say that God Almighty has so formed our minds that we cannot avoid believing in the existence of external matter, even as an objective thing. We cannot help believing in the objective reality of matter, notwithstanding all argument to the contrary. Again, Mr. Laming says:—

“Mind is capable of forming and retaining geometrical conceptions; and there is no difficulty in concluding the power of the Almighty to be limited only by His will.”

He is now going to account for the creation of material things: and if he had been here, I would have asked him whether mind is capable of forming geometrical conceptions apart from ideas which enter through the senses:— I mean the finite mind, supposing it had no senses whereby it succeeds in forming those geometrical conceptions? I apprehend not. But the author says:—

“Now, men have minds, and each can form conceptions,—it may be of small geometrical spheres, which it truly imagines to be within itself in space.”

I do not know what the “it” refers to, and therefore I am not able to attach a meaning to this passage. Nor can I understand this:—

“Those spheres may be conceived to be either distinctly separate, or to so intersect one another that any number of them may be more or less compounded with each other.”

That seems to me to be a very indefinite expression. I have made some efforts to get a definite idea out of it, but I am sorry to say I have failed. Mr. Laming proceeds:—

“As in the case of our own mind, at every instant, to a finite extent, so the mind of God at the creation can be imagined to have occupied itself, to an infinite extent, with first conceiving such immaterial spheres, and then, with a sovereignty entirely His own, *commanding them never to penetrate or intersect one another, even in thought.*”

Now, it seems to me that that sentence is strangely inconsistent with the idea of the immutability of the Creator. It suggests that God occupied Himself at the creation in conceiving these material spheres. Then the phrase at the end—“even in thought.” Is that the case in geometrical spheres? This certainly wants explanation; and again I am compelled to regret the absence of the author of the paper. Again:—

“That irresistible command, which no *creature* has the power to issue or to question, would, to all intents and purposes, convert the geometrical spheres instantaneously into the hard resisting matter of Newton, existing as a *conception in the mind of God*, just as they had done while purely geometrical in character.”

It seems to me that the theory at the bottom of this is the theory of the old philosophers that there is one continual flux going on, everything joining in it. I can understand the theory that to the Eternal Mind there is no such thing as matter—that matter exists only to the mind of man, and that, after all, to a very limited extent——

Mr. REDDIE.—That is your own opinion?

Mr. ROW.—No, no; it is the opinion stated here by Mr. Laming——

Mr. REDDIE.—Then do you controvert it?

Mr. ROW.—It seems to me that it is an assumption which wants proving. Many of these points may be quite true, but I say, give us some proof of them before you call on us to believe. What is the precise relation of matter

to the Eternal Creator, and by what means He has brought it into existence, are points which are entirely beyond all human conception. If we dash our heads against such points, we shall simply damage our brains. Mr. Laming says further :—

“Created matter is, on this showing, still immaterial to all immaterial things, which have no bounding surfaces for them to rest against; and materially solid to all material things which have such surfaces.”

Now, that is so obscure that I am not prepared to assign any definite meaning to it. It seems to me to introduce confusion among all our conceptions, subjective and objective. Are we to believe that there is no such thing as objectivity? He goes on:—

“From this it follows that things are not what they are in themselves absolutely, but rather what they are in relation to something else.”

That proposition, taken by itself, asserts that there is no such thing as *ousia* in existence, but everything is merely in a state of becoming *ousia*. Ideas were no part of the material creation, according to Plato; but the material creation simply existed so far as it partook in those ideas which stand on a higher intellectual basis. According to this passage, then, there is no such thing as *ousia*, but only a perpetual becoming. We can illustrate what we conceive to be a “constant becoming” by our notion of time. My notion of time is undoubtedly that it is not a present thing, but a thing constantly marking the past. That is a very fair conception of the view held by the old Greek philosophers, that there was no such thing as the existence of matter, but only the *γινόμενον* or perpetual becoming—

Mr. REDDIE.—You do not dispute the opposite, I suppose—that there is a substantive reality in material things. There is certainly a great deal to be said for the view that material things have no substantial existence; and it would be interesting if you advanced something on the other side of the question.

Mr. ROW.—I would not undertake to do that. As I have already said, there are certain things around me which have certain qualities attached to them, and which may or may not have an absolute existence of their own as matter; but I say that God Almighty has so formed my mind that I cannot help believing in the existence of something objective in them—

Mr. REDDIE.—Even Berkeley would admit as much as that; but the question is, *What* is that something which is objective?

Mr. ROW.—We cannot reach that point. There is another curious passage in Mr. Laming’s paper :—

“The atoms of matter, *thus constituted*, have only *form, volume, and physical solidity*.”

That is the exact theory of Democritus, and also of Lucretius. And Democritus, for the purpose of creating the universe out of atoms, says, in

addition, that these atoms are impressed and controlled by fate or necessity. It is a curious thing to find the early theories of the old Greek philosophers still cropping up here. Then, in another part, it seems to me that the author represents that motivity, as a force, is capable of exhaustion. Of course, any physical force is capable of being exhausted in its effects; but he appears to me to contend that moral force also is capable of exhaustion. My moral force, or the motive which produces, continues as strong as ever after it has been exercised—I mean, the effort I produce in realizing a result in motivity does not weaken the power or the moral force which I call into action.

MR. REDDIE.—I am sorry that the author of the paper is absent to-night; but I expected that from the beginning, as he is a great invalid and quite unable to move from one room to another unless he is carried. I also regret the absence of our usual chairman, from whom I expected we should have had some valuable and interesting remarks with reference to the author's treatment of the theory of the conservation of force or energy. The paper has already been criticised somewhat severely; and I am bound to admit that it is open to a very great amount of criticism. And first I think the title is open to objection. Mr. Laming has entitled his paper, "On the Immediate Derivation of Physical Science from the First Great Cause." This language is evidently erroneous;—the author means the derivation of things of which science takes cognizance, and not of our knowledge of them. But there is, in fact, a great looseness in the language throughout; and there is a very great difficulty in dealing with the paper, arising from the author's use of words in a different sense from that in which they are usually employed. With regard to that part of the paper in which Mr. Laming treats of space, there can be no doubt that we have got into a certain conventional mode of speaking of space as if it were an entity—not merely in the sense used by Aristotle when he says that a man who predicates that a thing is nothing, therefore predicates for it a kind of existence as nothing; but we certainly do all habitually speak of space in the way that the author of the paper does, when he says that "God is described as ever filling all space." I have no doubt we have all met with similar language in books that would pass current both amongst philosophers and theologians; but it appears to me to be erroneous. I agree with Mr. Row that, in ordinary parlance, we may, with a sort of accuracy, say that God fills all space, meaning thereby that there is no place where He is not; but then it is equally true that He is ever present at all places altogether, and in all His uncreated perfections. We cannot therefore predicate material extension of God without appearing to predicate parts as well. But there is a theological declaration expressly forbidding that. The very first of the Thirty-nine Articles declares that we are not to predicate body or parts of the Deity. Yet people do speak as if space were an entity: even Mr. Row, for example, talked of things "existing in space"—

MR. ROW.—But I do not maintain that space has an absolute existence.

MR. REDDIE.—The words "in space" are merely superfluous. But I think the author's meaning is distinct enough on this point. He says:—

"Mind is capable of forming and entertaining geometrical conceptions ; and there is no difficulty in concluding the power of the Almighty to be limited only by His will. Now, men have minds, and *each* can form conceptions, it may be of small geometrical spheres, which it truly *imagines to be within itself in space.*"

There is some inaccuracy of expression here, but there seems to be no doubt he does not intend to speak of an actual existence, in thus alluding to space. When we come to the passage beyond, in which the author attempts (and, as I think, legitimately) to explain, or to endeavour to realize, how something material could come to be created out of nothing, I think we must not press him too hard. I quite agree with Mr. Row that in all probability men will never be able to understand the method in which God has created matter ; but still, with regard to the material things surrounding us, it is a legitimate exercise of man's reason to endeavour to understand, so far as we can, how they came to be. Lord Bacon has told us that it is the glory of God to conceal a thing, but it is the glory of man to find it out ; and he speaks of man as being so incompetent to arrive at a thorough knowledge of the science of things that he considers the Deity is, as it were, almost playing with man as if he were a child on these subjects ; while man is continually baffled in his attempts to penetrate into the nature of even the very simplest things. When we try to discover how material things can have come into being from the act of an eternal, immaterial spirit, it is a difficult matter ; but perhaps not more difficult than to understand how we can get this solid table, for instance, by a pure spiritual conception, into the mind. On this point Mr. Row almost refuted himself ; for he admitted that his mind had nothing in it but impressions or ideas, and yet he had the impression of the solidity of the table in his mind, notwithstanding his difficulty to realize it. Berkeley does not deny the objective existence of things, or the existence of the external world, but only that they have a material substratum. He says their substratum is spiritual. He does not deny the existence of the table, or of anything else ; he merely attempts to account for the mode of their apparent existence. It is not a bad conception on the part of the author, then—it may be inadequate, but still it is ingenious—to suppose that the atoms of which we have heard so much from the ancient philosophers and from Dalton, although they are now a little at a discount in the philosophical world, were originally mere conceptions on the part of the Deity, as circles, triangles, and so on. Some of the atomic philosophers tell us that the atoms are round, and others that they are angular. Newton contended that all acids had their peculiar strong sharp flavour because they were made up of angular atoms which cut the tongue slightly. When Mr. Laming supposes that these atoms of matter are geometrical conceptions, to which the Deity gave a kind of existence by ordaining that they should not interpenetrate or intersect each other, that gives you solidity, and goes to solve the difficulty in understanding how anything solid which can resist any other thing may have proceeded from the fiat of the Eternal Spirit. But still it appears to me simpler and just as philosophical to suppose that all material things were

thus "created," or called into apparent existence, by the Word of God, without the intervention of imaginary atoms. For this theory is quite inadequate to account for all the varieties and beauties of visible nature. The beautiful colours of the rainbow, for instance, are as real things as this table. We cannot feel them, certainly, but in the dark we cannot see the table; but we must all admit that the colours of the spectrum are as much a part of visible existence as that material hardness which resists the action of our material bodies. Mr. Laming states that these things exist not in themselves, or as they seem, but in relation to something else, and that on that showing created matter is still immaterial to immaterial things; and in my opinion we have certain analogies which enable us to understand this. In the New Testament, for instance, we are told that when Christ appeared to His disciples after the Crucifixion the doors were shut, but we consider that appearance to be supernatural. But we do not suppose that a spirit would be deterred in its passage by doors. Take glass, again, which is a very solid material,—much more solid and compact in its body than a sheet of paper or many other opaque bodies,—yet light will penetrate through thick glass. If you admit that there is anything at all in light—any material thing, that is to say—you have it passing unmistakably through a solid body like glass. You cannot pass your hand through this table, certainly, but I have given you an analogy to show that spirit may pass through anything and everything. Every one who knows anything at all about light cannot fail to be struck with the fact that it does pass through such a perfectly solid body as glass; which is not at all a porous material, but remarkably continuous in its composition, and a great deal more solid than many opaque substances which would not permit the passage of light. It is not, after all, then, a question of solidity or its absence. Analogies in the same way may be found in heat and cold, which will pass through almost anything, and in electricity, which passes with the greatest facility through solid conductors, annihilating both time and space in doing so, but which is thoroughly balked when it comes in contact with some non-conductor, which it fails to penetrate at all. Mind, I am only partially defending the views of the author of this paper. I think it is legitimate and fair in argument to endeavour (even if baffled) to arrive at some understanding how and in what sense a material thing could come from an immaterial spirit. The author has also boldly attacked the doctrine of the "conservation of force." It is not perhaps very well known, and may be new to some of my hearers, that Professor Faraday, who may be said to be the author of the doctrine that force is always conserved and never lost, objected to the dogma of Newton that gravitation is a force which varies inversely as the square of the distance, precisely because that is inconsistent with the doctrine of conservation. If the force of attraction gradually fades away, as bodies recede from the centre of attraction, it is quite clear that that force is not "conserved," since it lessens. If the force is lessened to any extent at all, you cannot any longer maintain the "conservation of force." Professor Faraday did not, however, give up the idea of conserved force; but he logically wanted to give up this dictum with

regard to gravitation; and his views were not well received by the Cambridge mathematicians, who seemed determined to maintain at all hazards what they had taught so long about the variation of the force of gravitation, and yet they inconsistently don't dispute the conservation theory. But if I were to accept some passages in Mr. Laming's paper I should be unable to know what to believe as to this theory of conservation. He says :—

"Force, then, operating physically at a constant distance, is never lost, as those who teach the 'conservation of energy' assert that it can be; nor is the immunity from loss under those particular circumstances by any means 'conservation of force.'"

The force is not lost, but still, he says, we must not say it is conserved! I confess I cannot understand that. Surely, if it is not conserved it must be lost. He afterwards speaks—

"In disproof of the alleged constancy of energy or force under any form whatever."

Before, he drew a distinction between force and energy, but here he uses them as convertible terms, and says his argument is in disproof of their alleged constancy. I do not understand that either; and the great fault of his arguments against the current theories of force appears to me to be simply that either he does not quite understand what the current theories are, or else he uses the language which we find in all dynamical works in a totally different sense. He has attacked the force of gravitation, and he uses an extraordinary phraseology, which it baffles me to put any meaning upon at all. He says :—

"Attraction may possibly move the effect towards its cause or the cause towards its effect,"—

and I do not know in the least what the meaning of that can be. Then he actually substitutes the one for the other, and confounds cause with effect, saying in one place that "the effect may be a little after the cause as a rule," while in other places there is no difficulty (as I understand him to say) that "the one may be simultaneous with the other." He further says :—

"For want of recognizing the several elements of cause, physical science has been involved in serious mistakes, being made responsible for what mechanical writers call accelerating forces, entirely unknown to nature."

Now, no man who has seen a stone fall can profess to want knowledge of an accelerating force, as dynamical writers understand the term. Everybody knows that a stone sufficiently heavy not to be affected by the air falls with a constantly accelerated velocity. The reason the velocity is accelerated is because the force is constant, and that motion, once communicated, is kept up. The stone beginning to fall has to weigh down and pass through the atmosphere with its initial force of attraction, while ever new forces from attraction (still pressing it down) are added; and so we have, in every falling

stone, an instance of the "accelerating forces" which Mr. Laming says are "entirely unknown to nature"! I cannot understand how he can have brought himself to write such words. As I have already said, there is room for considerable criticism, and in some parts of the paper I cannot find the beginning, middle, or end of the author's meaning. In one passage he says :—

"The forces of gravitation, electricity, and caloric, or heat, are each so common that we may consider them to be acting in concert in insensible spaces intervening between the atoms in masses of matter."

In another passage he speaks of the "effect of caloric or heat being the same as gravitation in causing attraction"; and in a further passage he says :—

"In conducting this argument, no allusion has been made to *repulsion*, for the simple reason that no such force is required."

Required by what? Again I say I cannot understand his drift. He adds, "What we call repulsion is not a force, but a fact due to attraction"; whereas I have always understood that repulsion is the reverse of attraction. The spirit of the last two pages of the paper I quite understand, and I think I see what the author is aiming at; but I should be sorry to commit myself even to the approval of that part, owing to the mistiness of the language, and to the use of terms in a different sense to what we have all been accustomed to. It would be invidious, however, to go through the paper any further; and I may say that I think its merit chiefly consists in the fact that it has given us an opportunity of discussing such questions as whether space has properly an existence, or is only a mere negation, and as to whether the new dogma of the conservation of force is true.

Mr. WARINGTON.—With regard to the author's theory as to the origin of matter, let us carry it out to its legitimate extent, and see in what it involves us. In metaphysics it is especially difficult, and, indeed, almost impossible, except for those who are deeply versed in such studies, to see at once what a proposition involves unless it is traced out to its full extent. Mr. Laming tells us that all matter may have originated from the conception of something which should appear to be material in the mind of the Creator; that it has no existence out of the mind of the Creator at any time; that it is not material; that there has been a conception which has formed the pattern or type upon which what we regard as the material entity has been afterwards constructed; but that the original conception remains the only entity ever afterwards; and that that is the conception which exists only in the mind of the Creator. That is Mr. Laming's theory of the origin of matter. Then, I would ask, how do we become conscious of the existence of matter? It is not a thing which has any actual existence by itself,—it is not a thing which exists in my individual mind,—for it exists only as a conception in the mind of God. How, then, do I know that it exists? I can perceive matter—I cannot help perceiving it, for it is a part of my nature that I

should do so. Then what follows? Simply this, that God's conceptions of His material universe are a part of my nature. Therefore I, in fact, see things with my bodily eyes as God sees them with His mind. It does not require much logic to show that the conclusion involved is that I am a part of God's mind—

MR. REDDIE.—I do not think Mr. Laming means to go to that extent.

MR. WARINGTON.—He would not tolerate that extension of his meaning, perhaps, but I say that the theory requires that extension. I would submit that any theory which says that material things exist only as conceptions in the mind of God must, if expanded to its logical boundaries, land us in simple Pantheism—

THE CHAIRMAN.—I do not think that that is what Mr. Laming intends.

MR. WARINGTON.—No, I dare say not.

THE CHAIRMAN.—Nor do I think his language admits that in theory.

MR. REDDIE.—He has certainly said things which would contradict that view altogether.

MR. WARINGTON.—Yes, but that only shows that he is inconsistent, for the doctrine admits of that extension. With regard to the origin of physical force, he says that it is only moral force altered in the particular respect that it becomes unchangeable. That implies that moral force is changeable—

MR. REDDIE.—I think he means spiritual or mental force, not moral force in an ethical sense.

MR. WARINGTON.—It does not make the slightest difference. If he means mental, it includes what we call, distinctively, moral force. But surely moral force is as unchangeable and as invariable as physical force. Surely moral force changes no more than, and is as absolutely bounded by definite laws as, physical force. There really does not exist that difference which the author seems inclined to make in this respect. Then he speaks of ourselves having the power of changing moral force into physical force. He says, when a man's mind wishes to raise a weight—the wish being the moral force—he puts forward the physical force which enables him to lift it; and therefore the one force is the same as the other, only changed to a certain extent in its form. But he forgets that a man's physical power is limited, while his moral power is unlimited. I can *will* to lift any force I please, and if moral force can be converted into physical force, my power should be as unlimited as my will. But that is not so. My physical power is totally distinct from my will and intention to do a certain thing: my will and intention simply direct the use of my physical power. And if a man stands in such a relation towards matter and force, this gives us no clue at all by which we can in any way conceive God's relation towards matter and force. Our will avails itself of matter and force already existing to the hand; His will calls things into existence. We have no power of that kind in our minds. It seems to me, therefore, that all comparison of our moral volition and physical force with God's is entirely beside the mark, because the analogy fails in its most essential point. Then as to the conservation of force. I have always understood

that the doctrine of the conservation of force meant that force could not be lost; yet we are told by Mr. Laming that "those who teach the 'conservation of energy' assert that force can be lost." If that is so, I shall give up the doctrine which hitherto I have been accustomed to hold. Then Mr. Laming says :—

"Motion is alleged to change into heat, but to produce heat is to establish dynamic force; whereas to produce motion, which is alleged to be correlative to heat, is to change dynamic into static force. Besides which, the allegation violates an axiom by imputing to a single cause two effects, each equal to itself; for it imputes to motion heat, on the one hand, equal to the motion, and, on the other, physical reaction equal to the energy which has caused the motion."

But those who hold the doctrine do not do that. They say, If you get motion as the result of your motive power, you get no heat; but if any portion of that motive power is resisted and unable to pass on as motion, it immediately appears as heat. Therefore, instead of imputing two effects to the same cause, each equal to it, the two effects are only equal to the original cause when taken together, that part which causes the heat not having caused any part of the motion. But if we were to discuss the various matters contained in this paper fully, I am afraid we should have to lay down all the foundations afresh from the very beginning.

The CHAIRMAN.—The subject is a very difficult one, and it has been somewhat imperfectly dealt with in the paper; but even imperfect papers are useful, if only for the purpose of laying down debatable matter for discussion. And of this we have had a good example to-night.

The meeting was then adjourned.

REPLY BY MR. LAMING.

THE paper I have had the honour to submit to the Institute has been deemed worthy of a searching criticism, which of itself, considering the profundity of the subject, is occasion for self-gratulation.

I have described God in popular language "as ever filling space," which is objected to by Mr. Row as imputing extension to Spirit; and he proposes to replace the expression by saying, more philosophically, that God "is present at every point of space." The lesson being thus exactly enunciated, he need no longer entertain the idea of extension as an attribute of God in common with all material things, and yet be able to conceive the Creator as having the creation in Himself, both its mind and matter, because all is in space, the nothing ever present with Himself. Mr. Row, however, adopting the popular language in the philosophic sense of "ever filling," proceeds to say, "If the Deity has extension, and all created and finite things are also in extension, it will follow that all finite things are contained in Him." Mr.

Row comes to the conclusion that "the real difficulty of the whole subject, and that which the author endeavours to unravel, is how the Infinite has created the finite;" and he regards it as "beyond all human conception." The subject need not be encumbered with the untrue supposition of the extension of spirit, though the suppression of that extension will only add to his difficulties a new one. I have said, "If, then, the creation be in God, we must prepare to believe it to be only a mental conception, however real and material it may seem to us, and that seeming reality we must account for." To me it is a mental conception in God's mind, transferred to my own in a manner I will presently indicate. Mr. Row "can understand the theory that to the Eternal Mind there is no such thing as matter—that matter exists only to the mind of man." He fails to see that the human mind conceives the materiality of things because it is associated with a material body, in which the distinctive characteristic of matter can be mentally perceived; nor does he even feel sure that God can conceive the existence of matter in the absence of a body. Mr. Row asks, of course with reference to man, "whether mind is capable of forming geometrical conceptions apart from the idea of the senses." It may be that it is not; but, if the senses be necessary to the conception, man has them always in readiness. It is enough for my theory that I know the human mind associated with the senses can have the conceptions; and reason tells me that God can be a geometrician without senses, which possibly may imply a similar faculty on a small scale in the case of man, made intellectual after the image of his Maker.

As I wrote about "intersecting spheres" only to emphasize their non-existence, the fact that Mr. Row has not made out my meaning will have led him into no error. He charges me with an utterance "strangely inconsistent with the idea of the immutability of the Creator," on the score that "it suggests that God occupied Himself at the creation in conceiving these material spheres." If I have rightly understood the charge, I must acknowledge my inability to comprehend Mr. Row's construction of mutability.

I come now to the observations of Mr. Reddie. If, as I believe, the derivation of things of which science takes cognisance is the derivation of science itself, my subject will have an appropriate title, and I may pass on to Mr. Reddie's comments on the text of my paper. I am gratified that he has understood it well enough to say, "When Mr. Laming supposes that the atoms of matter are geometrical conceptions, to which the Deity gave a kind of existence by ordaining that they should not interpenetrate or intersect each other, that gives you solidity and goes to solve the difficulty in understanding how anything solid which can resist any other thing may have proceeded from the fiat of the Eternal Spirit." For he evidently conceives a possible *modus* in the creation of matter which it was the preliminary object of my theory to point out. To show the organization of matter "into all the varieties and beauties of visible nature," to trace the whole architecture of physical creation from its first material foundation, could not be attempted in the few pages I laid before the society, my utmost endeavours extending no further towards that coveted revelation than to point to the moral will of

God made physical as the due sequence of His geometrical conceptions, by acting from minute to minute with measurable exactitudes suited to the variable relations of matter with respect to time and place. This second part of my doctrine was left in outline, and Mr. Reddie has mistaken its incompleteness for confusion. He represents me as attacking the doctrine of gravitation, and as assimilating it with heat ; whereas I teach that each of the two is the attraction of a matter *sui generis*, one enormously greater than the other, while I profess entire allegiance to the laws of Newton. I have satisfied myself, and so said, that gravitation has nothing in its nature more than any other attraction to entitle it to be called accelerating ; and Mr. Reddie, by adducing the language of dynamical writers, as they do that of Galileo, only perpetuated to the force one unnecessary isolation, just as in our own times Faraday wished, by getting rid of conservation, to give it another. Perfect simplicity—the only foundation for action worthy of Almighty intelligence and power—requires the resolution of all the exceptions supposed by science among general principles before we can rest satisfied our knowledge is unquestionably that of nature's truth. Such at least is the conviction on which I based my present investigation, and which I am far from seeing any reason to alter. Mr. Reddie is not sanguine with respect to profound fundamental discovery. He does not think "men will ever be able to understand the method in which God has created matter" ; and yet he is of opinion that to do so is "perhaps not more difficult than to understand how we can get this solid table by a pure spiritual conception into the mind." I do not believe that man is to be "continually baffled in his attempts to penetrate into the nature of even the very simplest things" ; nor do I think it has hitherto been always the case, of which the results of gravitation afford us an appreciable example, although doubtless it, and every demonstration deduced from premisses not at the root of physical causation, labours under a consequent disadvantage. There is, and must remain, a longing desire to know the cause of gravitation, as well as its laws, and the position that cause holds in the general scheme of nature ; but the want of that knowledge will not shake our faith in its having some place in nature into which it will be some day accurately fitted. It is reasonable to suppose that if we had only discovered nature's beginning long ago, we should not have failed, as we have done hitherto, in understanding generally "her very simplest things," for we might then have traced her step by step, as we do her gravitation, without ever parting company. We have now made a beginning, recommended by its simplicity, and I still see no interruption to onward progress ; this I think is made out in my original text.

Mr. Warington has so misunderstood my theory of the formation of matter, and of its perception by the mind of man, as to imagine it makes some pretension to identity between the Divine and human minds. In this deduction of Pantheism he stands apart from my other critics, and I rejoice to believe he also will soon perceive that he has drawn his conclusion from mistaken premisses. The human mind comes into existence as one of God's creatures, with its capacity for conceptions just that which its Creator has made it, and

which we know is not great enough to read the mind of God respecting matter without some especial assistance from Him for that express purpose. On His own part God has imagined the magnitudes and forms of His geometrical spheres as the simplest of all geometrical conceptions, and given to each of them material extension by ordaining their reciprocal impenetrability, at the same time making it physical as well as material by causing it to operate on other material spheres with a constancy of action that makes all the actions comparable, and therefore measurable by one another. To a mind infinite in capacity all this is unquestionably practicable; but in order that our finite capacities may conceive materiality and the physical forces of matter, the human mind needs to be associated with an organism made up of matter and ruled by its forces. The material body is thus acted upon by external matter; and the associated mind comprehends the action by virtue of that mysterious union with its companion, of which the reasoning faculty is conscious. Instead, then, of there being in this process an arrogating to human nature of the attributes of Divinity, as Mr. Warington has believed, there is a simple recognition of the very distinction taught by religion, natural and revealed.

No opposition is made by any of my commentators to the doctrine of the immediate action of God's moral will in the physical direction of His material universe, which supersedes the prevailing idea of automatic powers created for the purpose in some manner impossible to be conceived. Mr. Warington seems to object only to the change of moral into physical force in the case of creature mind, where of course the change can only be regarded as enacted by God on our vice-regency and entire responsibility, extending to intention as well as to action, the latter being restricted within limits God has seen fit to impose. I think Mr. Warington's opinion will alter if he takes into consideration that were such a limitation not admissible on my theory, the circumstance might be urged as a great drawback to its probability.

I will only further add a few words relating to the reputed "conservation of force," to which my theory allows no quarter. The moral omnipotence of God is physical when it has made itself measurable by its action on matter, no action being the same under varying positions of matter with relation to one another. This is said to be the law of physical force denoting its power; to me it simply denotes the quantity of physical force established under given circumstances by moral volition. The physical force possible in the universe is unlimited, because it is the moral power of God acting in a measurable form to an extent varying from time to time with variable requirements of physical nature. Subject to measure in a physical form, according to the magnitude required under any particular condition of the universe, each force will have at that particular moment a definite total to which its amount of action or effect will be the reciprocal. The total attraction of gravity, taken as an example, is never the same under varying distances; and as much may be said of the electrical and calorific attractions. As in all the cases distances are subject to variation, so it must follow that the general total of force in the universe cannot be conserved—not even if the individual

forces be as causes indiscriminately satisfied with each other's effects, and, in addition, always vary inversely. That either gravity, electrical attraction, or calorific action should increase as another of them diminishes is taught by no *à priori* reasoning, and, as a fact, is unequivocally denied by every experiment so soon as it can be divested of mystery. Mr. Warington will be satisfied with fact in illustration. He remarks that the advocates of "conservation" teach that when two effects result from the same cause "the two effects are only equal to the original cause when taken together." Now, when we send two electrical currents from two equal voltaic batteries, instead of one, through a given conductor in a given time, we shall have of course a double current of electricity; but instead of merely that double effect of a doubled cause, we have, as admitted by Dr. Joule, a quadrupled calorific effect, the "conservation of force" seeming in that case to make two equivalents into six; as with gravity, the equivalents are increased from one to four by halving the distance. It may be instructive in more respects than one to explain that the voltaic experiment, in common with all others supposed to illustrate "conservation," resolves itself into a case of the equality of action and reaction: a double quantity of electricity, representing a quadrupled electrical force (as I have shown), acts on a given wire with a quadrupled electrical effect, producing a first physical equation; and the quadrupled electrical effect, as a heating cause, produces four equivalents of calorific effect, which is simply a second physical equation in the consecutive order of events.

The Chairman has remarked of the present view of the origin of nature that it presents a subject difficult to treat; and I have no doubt the difficulty of considering it has been in some degree increased by the insufficient manner of my dealing with it; but at the same time I venture to express my conviction that the doctrines I have endeavoured to make intelligible need only to be philosophically extended in all their bearings to justify generally the same amount of confidence I myself have in their truthfulness; and I am thankful to the Victoria Institute for allowing the discussion of a theory so entirely new.

[NOTE.—Mr. Laming's Reply, as well as his original paper, has been carefully read with his MS., and the proof-sheets of both were also revised by himself. I state this because of the difficulties I have felt with regard to the precise meaning of some of his sentences, and also with reference to some of his statements not specially questioned in the discussion: as, for instance, the remark he makes above, that "with gravity, the equivalents are increased from one to four by halving the distance," and (in a puzzling sentence, on p. 204) that Faraday wished "to get rid of conservation."—J. R., Ed.]

ORDINARY MEETING, APRIL 20, 1868.

THE REV. WALTER MITCHELL, M.A., VICE-PRESIDENT,
IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed.

The Rev. C. A. Row then read the following paper :—

*ON SOME OF THE PHILOSOPHICAL PRINCIPLES
CONTAINED IN MR. BUCKLE'S "HISTORY OF
CIVILIZATION" IN REFERENCE TO THE LAWS
OF THE MORAL AND RELIGIOUS DEVELOP-
MENTS OF MAN. By the Rev. C. A. Row, M.A., M.V.I.*

THE wide extent of the religious, moral, and philosophical subjects which the work of the late Mr. Buckle embraces, and some of which I am about to submit to your consideration, compels me to use the utmost possible brevity in my mode of treatment. I trust that my desire to be brief will not render my observations obscure, or cause me to do injustice to the author; or, what is even more important, to the great moral, religious, and philosophical interests connected with this subject. Mr. Buckle's work is professedly a history of civilization. The plan is formed on a gigantic scale. Owing to the premature death of its author it will remain a fragment. That fragment, however, consists of not less than 1,600 pages, and this forms little more than an introduction to his vast original design. It contains the philosophic principles on which the great work was intended to have been based. Few books which I have read raise questions which more deeply affect the dearest interests of mankind, or the whole range of Philosophy which is connected with religion and morality.

Mr. Buckle belonged to that school of thought which has been designated by the term Positive. In his work, the system of the Positive Philosophy is applied to the elucidation of history. The chief principles he has laid down in the opening portion of it. It is hardly too much to say that, if his views are right, the position occupied by those who have dealt with the great subjects connected with mental philosophy,

ethics and religion, has been incorrectly chosen, and that the great teachers of mankind have based their systems on mistaken principles. To this the Divine Author of Christianity itself forms no exception.

I find two obstacles in the way of treating this subject in a satisfactory manner. First, the mode in which many profound truths are blended with fatal errors; secondly, the length of Mr. Buckle's paragraphs, which renders it difficult to do him justice by quoting his exact words. Still, however, I do not think it fair to represent his opinions in my own language. I feel, therefore, bound to set forth a few of his most salient points in the exact words in which he has written them. To others I must content myself with a general allusion.

Before I proceed to illustrate his opinions by quotations, I shall only state that Mr. Buckle's theories, in the broad mode in which they are stated, seem to me inconsistent with any intelligible view of human responsibility; that they are founded on mistaken views of the character of religion, both natural and revealed; that Christianity receives but scant justice at his hands; and that many of his profoundest views of history (and I am far from wishing to dispute that his work contains many very profound ones, and exhibits in a striking point of view many great truths) are damaged by being deeply coloured with a philosophy respecting the truth of which we must at least say, Not yet proven. It is not for me to say to what extent Mr. Buckle was a theist; but the impression left on my mind by the perusal of his work is, if his philosophy is true, that the position of man in the world is such that it reflects credit neither on the wisdom nor the goodness of an intelligent Creator.

Mr. Buckle's general principle in dealing with history may be stated thus. The free will of man has exercised no appreciable influence on human affairs. In a word, we are devoid of all trustworthy evidence that it exists. As in the physical universe a certain amount of calculable force has determined its present condition, and if we could determine the amount of all past and future forces, we could determine all its past and future states; so the past, the present, and the future conditions of man are the result of those moral forces which we designate motives, and which act by a law no less invariable, and one entirely independent of any supposed control exerted over them by the human will.

Mr. Buckle lays down that the doctrines of Predestination and Free-will are alike fallacies. I shall not dispute that they are fallacious enough in the manner in which they have been frequently handled. But his doctrines go far beyond this,

and seem to me inconsistent with any practical belief in our responsibility. Let us hear him :—

“The doctrine of free-will (says he) rests on the metaphysical view of the supremacy of human consciousness. Each man, it is alleged, feels and knows that he is a free agent, nor can any subtleties of argument do away with our consciousness of possessing a free will. Now, the existence of this supreme jurisdiction, which is thus to set at defiance all the ordinary modes of reasoning, involves two assumptions, of which the first, though possibly true, has never been proved, and the other is unquestionably false. These assumptions are that there is an independent faculty called consciousness, and that the dictates of that faculty are infallible.”

Mr. Buckle makes some remarks on the uncertainty of our possession of such a faculty. He then resumes :—

“We may in the second place reply, even if consciousness is a faculty, we have the testimony of all history to prove its extreme fallibility. All the great stages through which the progress of the civilization [I presume that the word here means improvement] of the human race has successively passed, have been characterized by certain mental peculiarities or convictions which have left their impress on the religion, the philosophy, and the morals of the age. Each of these convictions has been to one period a matter of faith, to another of derision, and each of them has in its own epoch been as intimately bound up with the minds of men, as is that opinion which we now term freedom of the will,” &c. (p. 12.)

I find a difficulty in conceiving how a man of Mr. Buckle's reasoning powers could have written this passage. If I had time, I should demur to nearly every expression in it.

First, I apprehend that in any strict meaning of language it is incorrect to designate consciousness a faculty. It possesses nothing by which those states of the mind which we call faculties are distinguished. It has no function. Conscience is correctly called a faculty; but conscience and consciousness are two things entirely distinct. Every faculty must have a function. Conscience has a function. It determines right from wrong. But consciousness is simply the reflex action of the mind on itself. There is first the mental state of perception; then the consciousness of that perception; and lastly, the concentration of the mind on that consciousness centring in our own individuality.

I have often read of the supreme jurisdiction of conscience. It is so laid down by Butler. But in what sense consciousness can possess a supreme jurisdiction I am altogether at a loss to conceive. Between the nature of jurisdiction and the phenomena of consciousness there are no two points in common.

It involves an unspeakable confusion of thought to speak

of all consciousness as infallibly true. If such an assumption has been made, I agree with Mr. Buckle that it is utterly contradicted by facts. But to say that all consciousness is infallibly true is to confound between our consciousness of a perception, or a subject of thought, and the truth or falsehood of the perception or the thought—i.e., between consciousness and the object of consciousness. A man is conscious of whatever is passing in his own mind, whether it be true or false. Of this consciousness, and of its presence in the mind, he is infallibly certain. The thought, feeling, or conception is there, and he is conscious of its presence. This is true even of the dreams of a madman. He is infallibly certain that they are in his mind, though they are the delusions of a diseased brain. But this certainty has nothing to do with the object matter of the consciousness.

It is difficult to attribute to a man of Mr. Buckle's mental powers the mistake of having confounded between the truth of our consciousness itself, and the object of our consciousness. But the language of the passage is hardly consistent with any other supposition; and it is absolutely necessary that he should have done so if his reasoning is to have any reality against the doctrine of free-will.

When we say that we have a direct consciousness of freedom, we testify to the truth, not of a theory but of a fact. It is a matter of direct internal perception, of which I have a certainty closely approximating to that which I have of my own existence. It is closely connected with my perception of my self-conscious I, or of my personality. Every time I contemplate myself *in action*, I become sensible of volition.

Let us analyze its nature. I am infallibly certain that my coming here this evening was an act absolutely voluntary. Each stage of the process was subject to the control of my rational will. That will was acted on by motives. On these motives I exerted choice. With respect to each of them it was my purely voluntary act whether I would yield to it or not. At every period of the process, my action was purely voluntary. When I had come half or three-quarters of the distance, I am certain that I could have turned back; and my doing so, or not, depended on an act of my will. My will was acted on by motives; but it was in the power of my rational choice to contemplate one and to exclude another. I could not have prevented myself from coming, without substituting some motive in the place of those by which my will has been influenced; but I am certain that it was a matter of my own voluntary choice whether I would or would not be here to-night. At this moment I am absolutely certain

that it is a matter depending on my will whether I will or will not throw down this paper and read not another word.

There is nothing of which I can be equally certain as of this. It possesses a similar certainty to that which I possess of my own existence. I am more certain of it than I am that the chairman is at this moment sitting in the chair. I have the testimony of my consciousness that I have a perception in my mind that he is doing so; and of this I am infallibly certain. But there may be a doubt whether this consciousness is the correct representation of an external fact. But the consciousness of my own freedom represents nothing external to the mind. There is nothing objective in it; and consequently no room for doubt whether it conveys a true representation of an external reality. It is the direct consciousness of an internal perception which I positively feel, and of that I am certain. I am not conscious whether any other man has freedom. My belief that he has is either inferential, or is founded on testimony. But to the certainty of my freedom, consciousness affords similar evidence to that which it does for the existence of my own personality. No evidence of any truth can possibly be stronger. To reject it is to rush into worse than Pyrrhonism. It is also indelibly impressed in the structure of language. It is impossible to contemplate myself in action without becoming conscious of the presence of a rational will, which is influenced by, but is not the slave of, the motives which act on it. It seems, therefore, scarcely credible that a writer of Mr. Buckle's powers should have confounded our rational self-conscious perception of freedom, which is indissolubly united with the perception of self as the independent centre of voluntary action, with the consciousness of any delusion which may enter into a diseased mind, and have put them on a par as an evidence of truth. But, if he is to be believed, the evidence supplied by consciousness to the truth of my voluntary agency is no stronger than that which foolish men and women have for the belief that it is unlucky for thirteen to sit down to a dinner-party, or for any other folly; for he places our belief in our freedom on a level with those "convictions which have left their impress on the religion, the philosophy, and the morals of the age. Each of these opinions," says he, "has been at one time a matter of faith, and at another of derision; and each of them has in its own epoch been as intimately bound up in the minds of men as is that opinion which men term freedom of the will." I need say no more.

The philosophy of Mr. Buckle's work is vitiated by the rottenness of his first principles. We shall see that it is inconsistent with any rational belief in human responsibility.

The moral character of an action is entirely dependent on its voluntariness. A voluntary action is one of which the power to do or forbear is in ourselves. Aristotle has taught us, more than two thousand years ago, that an action which is not voluntary is incapable of either praise or blame; that no action can be either virtuous or vicious, unless it is accompanied with a feeling that it is a voluntary act; and that the principle of the action must be within our own power. An action not within our own power is no more virtuous or vicious than the act of a machine. The philosopher has proved that to render an action virtuous or vicious, the following conditions are requisite. It must be voluntary; it must be within our own control; and, besides this, it must be the subject of rational choice, which he designates by the Greek term *προαίρεσις*.

The whole of his masterly analysis of the relation which the voluntary principle bears to virtuous action, and its culmination in the mental act of rational or moral choice, is contained in the third book of the Nicomachean Ethics. To abridge it is hardly possible, and to refute it hopeless; but to transcribe it in intelligible English would exceed the limits of this paper.

Under what circumstances do we hold men responsible for their actions? What is the nature of that feeling which we designate a sense of guilt? I answer, that both are inseparably united with the perception that the action has been voluntary. Once convince us that a man was not a free agent, and we cease to hold him accountable. If motive exerts a necessary influence on the mind—if the will is powerless to resist the influence of impulse, we cease to be responsible for what we do. It may have been a man's misfortune to have done us an injury; but when we clearly perceive that he was not a free agent, we are as incapable of holding him responsible as the stone which we kick against, and which hurts our foot. In the same manner a sense of guilt, self-condemnation, or repentance, can only be felt for an action which we feel to have been within our own power to do or to abstain from. We may be very sorry that we have been made the unwitting agents in an act the consequences of which are pernicious. But for the act itself we can feel neither a sense of guilt, repentance, nor remorse. It was our misfortune, not our sin, to have committed it. A sense of freedom, therefore, is bound up with the moral character of our actions; and where there is no freedom, there can be no morality.

It is on these accounts that all Pantheistic religions are destructive of a sense of sin. Where actions are not voluntary, sin is not possible.

But, important as the subject is, I must pass onwards. At page 17 Mr. Buckle observes :—

"The only positions which, at this stage of the inquiry, I shall expect the believer in the possibility of the philosophy of history to concede are the following: that when we perform an action, we perform it in consequence of some motive or motives; that these motives are the results of some antecedents; and if we were acquainted with the whole of the antecedents, and with all the laws of their movements, we should with unerring certainty predict the whole of their immediate results. If, for example, I am intimately acquainted with the character of any person, I can frequently tell how he will act under any given circumstances. Should I fail in my prediction, I must ascribe my error, not to any arbitrary or capricious freedom of the will; . . . but I must be content to suppose, either that I had been misinformed as to some of the circumstances, or else that I had not sufficiently studied the ordinary operations of his mind. If, however, I was capable of correct reasoning; and if, at the same time, I had a correct knowledge both of his disposition and of the events by which he was surrounded, I should be able to foresee the line of conduct which, in consequence of these events, he would adopt."

I am far from being sure whether the knowledge which Mr. Buckle postulates in this passage as necessary for the completeness of philosophical history is not the special privilege of Omniscience, and cannot be possessed by any finite being. But, long as my quotation is, we must hear him to the end :—

"Respecting the metaphysical dogma of free-will, and the theological dogma of predetermined events,* we are driven to the conclusion that the actions of men, being determined solely by their antecedents, must have a character of uniformity—that is to say, must, under precisely the same circumstances, always issue in precisely the same results. And as all antecedents are either in the mind or out of it, we see clearly that all the variations in the results—in other words, all the changes of which history is full; all the vicissitudes of the human race; their progress or their decay, their happiness or their misery—must be part of a double action; an action of external phenomena on the mind, and another action of the mind on the phenomena."

I have made this long quotation for the purpose of preventing the possibility of misrepresenting the views of Mr. Buckle. To do him justice, he has fearlessly carried his

* It should be observed that under the term Predestination, Mr. Buckle, and writers of kindred schools of thought, include what we mean by the ordinary providential action of Almighty God.

principles out to their utmost possible limits. At page 20 he says :—

“The actions of men are, by an easy and obvious division, separated into two classes—the virtuous and the vicious ; and as these classes are relative, and when put together complete the total of our moral conduct, it follows that whatever increases the one will, in a relative point of view, diminish the other ; so that if we can at any period detect a uniformity in the vices of a people, there must be a corresponding regularity in their virtues ; or if we could prove a regularity in their virtues, we should necessarily infer an equal regularity in their vices—the two sets of actions being, according to the terms of the division, merely supplementary to each other. Or, to express the proposition in another way, it is evident that if it can be demonstrated that the bad actions of men vary in obedience to the changes in the surrounding society, we shall be obliged to infer that their good actions, which are, as it were, the residue of their bad ones, vary in the same manner ; and we shall be forced to a further conclusion, that both variations are the results of large and general causes which, working together on the aggregate of society, must produce certain consequences without regard to the volition of those particular men of whom society is composed.”

I am not prepared to deny that there is a considerable amount of truth in several of these statements ; but the mixture of error deprives them of much of their value. The truth which they contain was much better expressed by another philosophical historian, who wrote nearly 400 years before the Christian era. I need not say that the historian to whom I allude is the great historian Thucydides. He was content to write a philosophical history without the ambitious attempt to force all things divine and human into conformity with an *à priori* theory and the principles of the Positive philosophy. The Greek tells us that he wrote his history in the full belief that like causes would for the most part produce like results ; but, notwithstanding this, he was a foolish believer in the freedom of human actions. Mr. Buckle, however, could not be satisfied unless he attempted to reduce the whole moral and spiritual worlds to a sequence as invariable and necessary as the connection between cause and effect ; or, to use the more approved phraseology of the Positive philosophy, between antecedent and consequent in the material universe. It seems never to have occurred to him that, to enable him to have the smallest chance of attaining such a view of human things, a greater aid must be invoked than the science of statistics, on which he mainly relies. As I have already hinted, it will be necessary for him to invest himself with the attribute of Omniscience, for nothing short of it can take a comprehensive

view of all the antecedents and all the consequents of human actions.

I entirely agree with Mr. Buckle in a certain portion of his position. The incorrectness of his principles arises rather from a *suppressio veri* than a *suggestio falsi*. Doubtless all human actions are the result of motives, and these motives of other antecedents; and it is quite true that these motives or antecedents exercise a powerful influence in producing a modified uniformity of result. But they act neither necessarily nor invariably, but for the most part, and subject to a vast complication of conditions of various degrees of contingency, and are liable to be modified within certain limits by that power which, despite of Mr. Buckle, we designate individuality or will.

One fallacy has crept into Mr. Buckle's reasoning, through the confusion which he has introduced between motives and antecedents. These, at any rate in the latter part of the quotation, he has identified together. The terms antecedent and consequent are dangerous terms to apply to the operations of the mind, because they introduce a confusion between the causes and effects, the antecedents and consequents of nature, and the various influences which act on the mind. All motives are antecedents, but all antecedents are not motives. This, Mr. Buckle seems to have overlooked, and by doing so he has assumed the very point which he was required to prove. Among the antecedents of human actions, the rational will and the individuality occupy a very important place. According to our view of the case, they are as much antecedents as any motives, or the antecedents of those motives. The failure to perceive this has vitiated the whole of Mr. Buckle's reasoning, and led him to assume the point which he has undertaken to demonstrate, viz., the nullity of the influence of free-will in the affairs of men.

Mr. Buckle also errs when he refers all motives to a common quantitative standard, and omits to discriminate between different classes of motives which differ in character from each other, and are incapable of being reduced to a common quantitative measure. Another fallacy is found in his quiet assumption that the action of the will is nearly, if not quite, synonymous with the action of chance; and that to assert that human affairs are influenced by the one is much the same thing as to proclaim them under the dominion of the other. Between the action of the rational will in man, and that of the principle which we designate chance, I cannot see the smallest necessary connection.

The imperfection of human language and the want of

distinct terms to designate distinct ideas is the fruitful source of endless confusion of thought. Nowhere is there equal danger of this confusion as in the philosophy of mind, owing to the fact that nearly every term which we are compelled to use in treating it, in its primary sense, is applicable to the world of matter. The plain fact is, a moral cause—or, as Mr. Buckle loves to call it, an antecedent—differs wholly from a physical one even in its conception. In speaking of ourselves as causes, we mean a wholly different thing from what we mean when we use the same term in relation to physical causation. The one always involves the idea of freedom and self-origination, which the other excludes. When I say that I am the cause of my actions, I mean a wholly different thing than when I say that a steam-engine is the cause of its results. The one may be a set of antecedents and consequents; but to express the phenomena of the other by a similar term is to invite confusion of thought.

No less clear is the distinction between motive and force; though, owing to the imperfection of language, we are constantly speaking of the force of motives. To suppose that when we are speaking of the force of a steam-engine and when we are speaking of the force of a motive, we are speaking of things specifically the same, is the greatest of fallacies; yet into fallacies of a similar kind there is no little danger of falling. All physical forces may be expressed by a common measure of quantity; motives or moral forces cannot. Physical forces compel; motives act on the rational will in a manner differing wholly from the idea of compulsion. They vary both in intensity and in character.

I fully agree with Mr. Buckle, that motive of some kind is an antecedent of all human action. But it is not the only antecedent. To act without motive is impossible. Motives also are of the utmost variety in kind. One class is related to the lower portions of human nature; another to our rationality; another to the highest portions of our spiritual being. It is untrue to say that their power to command is a mere question of greater or less intensity. One of the higher motives is capable of influencing the mind against the much greater intensity of a lower one. For example, a man may be impelled by a strong desire for sensual indulgence, which, if allowed to be deeply meditated on, would propel him into intemperance. The higher will connected with the reason restrains it. The will presents a motive of a wholly different character to the contemplation of the mind. The voice of what we designate conscience makes itself audible, and the temptation is overcome. These latter influences differ from

the former, not only in intensity or force, but in their entire conception and *modus operandi*. To confound them together under the common terms antecedent and consequent must lead to a false philosophy.

Mr. Buckle's original fallacy of ignoring the effects of human freedom is the foundation of all the great blemishes by which his work is disfigured, and it is impossible to say that they are either few or small. I have already shown the connection of the will with our self-conscious personality, and that with our higher reason. I shall designate their union in all their complicated action by the term the rational will. The force of this principle in our struggle with the inferior portions of our nature has been recognized by every good and holy man in every age; nay, by all men in all ages. Its existence has deeply impressed itself on the structure of language. The desperate struggles of the one with the other have been most graphically described by St. Paul in Romans vii. That description has found a response in every human soul which has deeply meditated on it.

The action of the rational will in neutralizing a lower motive through the influence of a higher one, is exerted in every instance where we triumph over a powerful temptation. Without it our triumph over temptation would be impossible. Its influence is the source of all rational self-denial. Inferior animals exercise a species of self-denial, but this originates in the superior power of one instinct compared with another. The maternal love of a hen, for instance, overcomes her desire for food. But quite different is the self-denial of man, exercised under the influence of conscience, culminating as it has in the surrender of his life under a sense of the duty which he owes to his Maker. But if I understand Mr. Buckle's theory aright, self-denial must with him be an unmeaning term; for if all motives possess a common quantitative measure, and dominate in proportion to their intensity, and the action of the rational will counts for nothing, self-denial, after all, must be only one act of self-gratification triumphing over another.

The whole of this question has been discussed by Aristotle in the seventh book of his *Ethics*, which I am inclined to think is the greatest book in that great work. Its analysis is masterly. It has its imperfections, doubtless, which philosophers with the New Testament in their hands ought to have supplied long ere this; but I am acquainted with no work where this has been accomplished. As an analysis of some of the profoundest depths of human nature, written by a heathen, it strikes the mind with amazement. It is impossible for me to transfer even an abridgment of its contents to this

paper. I can only refer to it as containing an ample refutation of some of Mr. Buckle's fallacies, composed by a heathen philosopher more than two thousand years before they were written.

Mr. Buckle has broadly stated his opinion, which he says he has arrived at after the most careful study of ancient authors, that Christianity has added nothing to our knowledge of morals. If this be the case, I have already pointed out where the principles on which his moral philosophy is based can be confuted by a heathen writer. But the assertion I can hardly treat with patience, as I am precluded from giving it a direct refutation by the necessary limits of my paper. As it is an assertion which is continually recurring, and is frequently put forward as if it were an indisputable truth, if I am not guilty of presumption I will state where I have recently grappled with the entire question, and, as I think, thoroughly refuted it. The whole subject is dealt with in the fifth chapter of *The Jesus of the Evangelists*, entitled the Moral Teaching of our Lord. It consists of thirty-three pages, and cannot be reduced in length.

I must beg pardon for slightly diverging from my subject. Mr. Buckle would perhaps say that I am impelled by one of his antecedents to do so, and that it is a case of the necessary action of all-powerful motive. The impulse is, I own, a strong one, but I feel assured that it is under the control of my rational will. In connection with the subject of Morality and Christianity, at p. 164, Mr. Buckle has made the following most marvellous statement. In the text he is denying the influence of moral motives and moral instincts on civilization. He asserts that little or no progress has been made in our knowledge of the principles of morality and motivity for thousands of years. When they were first discovered, with singular facility, he forgets to tell us; for surely there must have been some period when they were first brought to light, since man emerged from a condition of utterly savage darkness. He adds, "Not one jot or one tittle has been added to them by all the sermons, homilies, and text-books which moralists and theologians have been able to produce."

This is a strong statement, but the one in the note to which I allude is far stronger; and it is most inexplicable how a man of Mr. Buckle's compass of mind could have brought himself deliberately to assert it. It is as follows—"That the system of morals propounded in the New Testament contained no maxim which had not been previously enunciated; and that some of the most beautiful passages in the apostolic writings are quotations from Pagan writers, is well known to every scholar."

Now, with respect to the first portion of Mr. Buckle's assertion, after the reference which I have made I shall content myself with saying that, to a great extent, it is not true; and that the little truth which it contains is so put as greatly to misrepresent the fact. But with respect to the second portion, that "some of the most beautiful passages in the apostolic writings are quotations from Pagan writers, is well known to every scholar,"—if my rational will did not exert a powerfully controlling influence, I should be impelled to use hard language. I shall only say that it is positively untrue, and that he ought to have known that it was so; or if he did not know it, it is only consistent with the fact that he had never read the New Testament through, or had forgotten its contents. Perhaps I may be allowed to put in a charitable supposition, that he has confounded the numerous quotations of the Old Testament found in the pages of the New with supposed quotations from Pagan writers. What is the fact? There are only two quotations from Pagan writers in the whole New Testament, both made by the Apostle Paul, the one of which is the well-known passage in his speech at Athens, quoted from the poet Aratus, "We are also his offspring;" and the other is the passage in the Epistle to Titus, the quotation from Epimenides, "The Cretans are always liars, evil beasts, slow bellies." I do not discern that either of these passages has any pre-eminent beauty beyond the other numerous beautiful passages contained in the Apostle's writings. The latter, which simply asserts that the national character of the Cretans united some of the cruel qualities of the brute with the cunning and truthlessness of the Greek, is certainly not conspicuous for its beauty, although it is doubtless a plain statement of an unpleasant fact.

I am not ignorant that some attempts have been made to show that St. Paul had read *Æschylus*, *Sophocles*, and *Euripides*. As to whether he had done so or not, I wish to express no opinion. But the evidence which can be gathered from his writings that he had, is at best extremely small, and the whole is a matter of conjecture. As for the other writings of the New Testament, they do not present a trace that their authors had ever read a Pagan writer of any kind, with perhaps the single exception of St. Luke. Even here the indications are most indistinct and uncertain. There is not the smallest indication that a single saying of Christ which he reports was derived from such a source. If there are any other assertions in Mr. Buckle's work made with equal recklessness, it deprives him of all authority as a correct reporter of facts.

Assertions like those of Mr. Buckle are somewhat similar to

a case which has occurred within the last few months. I need hardly say that I allude to the article in the *Quarterly Review* of October last, entitled "The Talmud." The views of this writer respecting the morality of the New Testament are only a little less fallacious than those of Mr. Buckle. At one thing I am astonished, viz., the facility with which such assertions are swallowed, not only by the public, but by those who ought to know better. Perhaps it is to be attributed to an ever-increasing desire for the new and the sensational.

I must mention one point for the purpose of proving the entire fallacy of the assertion that the teaching of our Lord contains nothing new in connection with morality. The great doctrine of faith, as taught by Christ and enlarged on by the apostles, is absolutely new. It is remarkable how much its importance has been overlooked as bearing on the whole question of moral philosophy and motivity. Our Lord uniformly employs this principle as the great motive power by which He uniformly acted on the spiritual and moral worlds by which the amelioration of man from a state of degradation is alone rendered possible. Previously to the enunciation of the great doctrine of faith by our Lord, it had been unthought of by poet, priest, or philosopher. Our Lord announced it as the great motive principle, powerful to act on man's spiritual and moral being. Philosophers know nothing of it. Aristotle himself expressly asserts that the intellect is no motive principle in man. But faith is an intellectual act, closely connected with man's spiritual and moral nature. The motive character of faith forms the foundation on which our Lord's spiritual and moral temple is erected, of which His glorious personality, as exhibited by faith and to faith, is the chief corner-stone. Our Lord proclaimed faith as the one great means of man's regeneration and improvement; and since He has proclaimed it, it has exerted a spiritual and moral power on man, compared with which all the motives with which the philosophers were acquainted are utterly insignificant. It is high time that a true moral philosophy should be created, which recognizes this and other great truths of which the Gospel of Christ was the first exponent.

But I must return from this digression. I am a firm believer that the reign of law dominates in the realms of mind, and that the moral, religious, and intellectual condition of the individual grows out of, and is largely determined by, the moral, religious, and intellectual atmosphere in the midst of which he lives. The genius or the powers of the individual can only raise him above this to a certain point of elevation, and that not a very lofty one. The law of our progressive improvement is a very slow one; and it is lamentable to be

obliged to admit the presence of another law more rapid in its operation—that of retrogressive degeneration. If improvements in the condition of human society ever take place at a more accelerated ratio, they can only be effected by external influences. These also are deeply modified by the condition of the moral, religious, and intellectual atmosphere in the midst of which they exist. It is necessary thus to refer to my own views to prevent the possibility of misapprehension, or the supposition that I am impugning Mr. Buckle where I am not. My own opinions as to the operation of these laws I have briefly stated elsewhere.* What I am contending against is the unnecessary matter which Mr. Buckle imports into what I believe to be a statement of a great truth, and his embodying it in propositions of unnecessary universality.

This arises from his theory of antecedents and consequents, his denial of freewill, and his attempt to establish a philosophy of man as necessary as are the conditions of his physical being. In some respects there is a similarity between the results of his philosophic principles and those of Mr. Carlyle, widely as they differ in other respects. I am the last person to speak disrespectfully of some of the works of the latter writer, especially of the *History of the French Revolution*, from which I have derived the greatest instruction. But, while acknowledging the good, I am deeply sensible of the errors of both writers. One principle underlies both minds in common—the principle of the inevitable action of force. With them the individual is nothing; the mass and the inevitable current of events are everything. Others, on the contrary, commit the error of assigning everything to individual agency, and little to the great moral, religious, and intellectual forces. One of the great errors of both writers is that they concur in representing human things as moving by the force of inevitable destiny, and that whatever has perished, has perished because it deserved to perish. Mr. Carlyle assigns great weight to the occasional advent of a great man, when nature vouchsafes to send us one. In other respects, individuality is by both writers reduced nearly to zero. Of course I do not mistake Mr. Carlyle for a Positive philosopher. For the philosophical aspect of that system he would feel unbounded scorn.

Three chief powers control the affairs of men, and make them what they are. First, the influences which act on the masses; secondly, the action of individuality; thirdly, the orderings of the providences of God. If we overlook either of these influences, the result will be a false philosophy.

I cannot avoid putting one or two questions, which I appre-

* I have discussed this subject in the sixth chapter of *The Jesus of the Evangelists*, as far as is necessary for the purposes of my argument.

hend must be answered in favour of the influence of individuality and of Divine Providence. What effect would have been produced on the world's history if Pausanias, instead of assassinating Philip, had, by mistake, assassinated Alexander? Mistakes of this kind have been sometimes committed. What effect would have been produced on the development of the Greek mind, and by consequence on the whole course of modern civilization, if some stray missile had killed Themistocles at Artemisium? The battle of Salamis would never have been fought, Greece would have been conquered by the Persians, and the whole course of civilization changed. What effect would have been produced on the modern world if the coachman of Napoleon the First had not been somewhat the worse for liquor, and, instead of driving his master furiously to the theatre, had driven at a more moderate pace? In that case the explosion of the infernal machine would have taken place, not when the emperor was at a safe distance, but when he was within a few yards of it, and the course of modern history would have been different. Or, to take a more solemn subject, what would have been the effect on the whole course of European civilization (I speak in a human point of view) if the Apostle Paul had never set foot in Europe? Would the course of human affairs have been the same if either of these events had happened differently? If so, the providences of God and the individuality of man are appreciable factors in the sum total of the affairs of men; and if we ignore their influence, a philosophical view of history is impossible. I do not wish to deny that the influences to which both these writers appeal are very weighty ones, but I except against the assumption that they are almighty, as wholly unphilosophical.

The principles laid down by Mr. Buckle often warrant far more universal and necessary conclusions than he feels it convenient to draw from them. In the passage which I have quoted, he tells us that "if we knew the whole of the antecedents and consequents, we could, with unerring certainty, predict the whole of their immediate results." This is a necessary conclusion from his premises. But a little further on he is content with a more humble result. "If," says he, "I am intimately acquainted with the character of a person, I can frequently tell how he will act under any given circumstances." This latter assertion is unquestionably true. But the premises required, not that he should frequently tell, but that he should always tell unerringly. We come back to the old and well-established position of moral truth—a truth which, at any rate, is as old as Aristotle—and not to the new light of the Positive philosophy, that universal moral proposi-

tions differ from those in necessary matter, the one being true always and under all circumstances; the other, only for the most part. That the angles of every triangle are equal to two right angles is a proposition invariably true under all circumstances. That motives will produce similar results under similar circumstances is true for the most part only. In other words, it is subject to the laws regulating moral cause and effect, and not to the antecedents and consequents of the material world.

Mr. Buckle calls the belief in free-will a dogma. I cannot understand how it can be correctly designated a dogma. The belief in a predetermined order of events, unless we arrive at it by a course of induction, which is impossible, is a dogma. But my belief in my own freedom is no more a dogma than my belief in the existence of light, or that I am now reading and not speaking. To place both under the same category is illogical.

The previous remarks almost render it unnecessary that I should make any further observations on Mr. Buckle's theories respecting the virtuous and vicious actions of mankind. If his premises are granted, each advancing stage follows as a necessary consequence. I am far from wishing to contradict the position that the great mass of mankind are affected, for weal or for woe, by the moral, religious, and intellectual atmosphere in which they have been born, and in the midst of which they have been educated. The influence exerted by it over our whole being is immense. The man who is born a Bengalee, for the most part gets engrafted into his moral nature the vices of that character; and, if I may be allowed to humour our self-love, a man who is born an Englishman acquires the magnificent virtues of our race. But this is a moral truth only, not a universal or inevitable one. In the words of Aristotle, it is true *ὡς ἐπὶ τὸ πολὺ*, and no more. We know, to our own cost, that there are multitudes in this metropolis who are slenderly endowed with English virtues, and are following a lamentable and consistent law of degradation.

But it is no inevitable consequence arising from the laws of the moral world, that every individual of these degraded classes must follow this course of degradation. No doubt the aggregate of society follows certain general laws; but I must protest against the assertion that "this is without any regard to the volition of those particular men of whom society is composed." How Mr. Buckle could have overlooked the fallacy of his reasoning is inconceivable; for it is evident that the aggregate results produced on society must include all the

individual influences, the motives, and the action of the rational will. The law in conformity with which society has developed itself, must include the action both of motives and of volition. The law of development is nothing but a generalized statement of the complicated action of these conjoint but wholly distinct powers. The mode in which Mr. Buckle places it is as destructive of the principles of morality and responsibility as the theories of the mad doctors.

I must now briefly allude to the manner in which Mr. Buckle endeavours to confirm his theories by the aid of the science of statistics.

Here, again, let it be clearly understood that I am not going to utter one word for the purpose of lessening our estimate of that science. Statistics are of the greatest value when they correctly exhibit the results of well-arranged facts, and when they are kept in their proper place and in due subordination. What I protest against is the growing tendency with writers of a certain class to represent them as the only road to the temple of Truth; or, to use the language of Isaiah, to make of them a god and worship them; to make them into a graven image, and to bow down thereto. The way to the temple of Truth is so arduous that we want to have the aid of every possible help to conduct us thither.

Mr. Buckle tells us that we are taught by the science of statistics that the number of murders which take place in any particular country is pretty much the same year by year, in proportion to the population. This may be true, and yet prove nothing for Mr. Buckle. On his principles it ought to be, not pretty much the same, but always and invariably the same; otherwise, the antecedents act only for the most part. But Mr. Buckle's theory is, that they act necessarily and independently of the will of the individual. It is singular that a man of such acuteness should have overlooked the fact that the statistics are the combined result of what he designates the antecedents, and of the will itself, and do not represent the results of the independent action of either one of them:—

“So uniform (says Mr. Buckle) is the production of crime, that it is more certain in its results than the progress of physical disease and death. Thus, for instance, the number of persons accused of crime in France between 1826 and 1846 was by a singular coincidence about equal to the male deaths which took place in Paris during the same period, the difference being that the fluctuations in the amount of crime were actually smaller than the fluctuations in the mortality; while a similar regularity was observed in each separate offence, all of which obeyed the same law of uniform and periodical repetition.”

Mr. Buckle observes in a note that "this is even true, notwithstanding the occurrence of a revolution which convulsed society, and brought in a new dynasty." The net result is that, according to Mr. Buckle's philosophy, the laws which regulate the moral world are more uniform in their operation than those which govern the physical universe.

Unfortunately, I have not the means of examining into these very curious statistics. I am compelled, therefore, to assume that they are both correct, and correctly stated. But for the previous reason, that all statistics must represent the complex results of the conjoint action of the rational will, and of the motives which act on that will, I must demur to the conclusion which Mr. Buckle would draw from the alleged uniformity. In good truth, if his theory is correct, it will be the duty of her Majesty's Government to introduce a reform bill of a wholly different kind from any legislation which has yet been attempted in the history of man, and, by negotiation, to try to persuade all foreign Governments to imitate their example. This reform bill must enact, that all such expressions as virtue, vice, duty, obligation, right, &c. &c.—in a word, the whole class of similar forms of conception which the stupidity of man has so deeply impressed on human speech—be removed out of the English language with all convenient speed. As the French revolutionists in their day substituted a new calendar in place of the old and effete Christian one, so human language will have to undergo a purgation from such unmeaning terms, in conformity with the new gospel according to statistics and the principles of the Positive philosophy, the proclamation of which is to herald in the true Millennium. The necessity of doing so will certainly arise if man's moral and spiritual nature is bound by laws more invariable in their results than those which regulate his physical being.

It is certainly difficult to conceive of any cause which can connect the number of male deaths in Paris with the number of crimes committed throughout France; and I apprehend, if such an invariable ratio exists, it must involve a problem infinitely more complicated than the solution of that which tests the endurance of the powers of the greatest mathematicians; viz., the determination of the conjoint influence of a number of variables, varying as each other. If this law of variation exists in *rerum naturâ*, we cannot help being struck by the remarkable fact that, according to these statistics, it is not the number of actual crimes committed in France which vary in a direct ratio to the number of the male deaths in Paris, but that it is the number of persons "who are accused of the crime," of whom a certain proportion are doubtless innocent. The

real proportion, therefore, exists between the number of the male deaths in Paris and the tendencies of the French police and others to accuse people of crime—unless they are possessed in France of the most desirable secret of knowing how to avoid accusing any one but the guilty party. If Mr. Buckle is right, the tendency in France to accuse people of crime follows a law as invariable as that which regulates the physical causes of death; and also, a similar ratio exists in the tendency to accuse others of each separate offence. I can only say that this is marvellous if true, and that he who can believe it need not sneer at the credulity of one who can believe a miracle.

Mr. Buckle next adduces the uniformity which prevails in the number of suicides in proportion to the population of a country as another convincing proof of the soundness of his principles, and in the name of it we are invited to renounce our belief in our free agency. His words are worthy of quotation—"Among public and recognized crimes, there are none so dependent on the individual as suicide." I presume that by the evils dependent on the individual, he can only mean dependent on the action of the will of the individual. But this is made plain by what he says a little further on—"Men," says he, "are not goaded to commit suicide by companions, nor are they interfered with by any external association which might hamper what is termed the freedom of the will."

The answer to Mr. Buckle is a simple one, and I am utterly at a loss to conceive how it could have escaped his observation. The facts are exactly the contrary to what he conceives them to be. He says, "Among public and recognized crimes, there are none so dependent on the individual as suicide." The verdict of every jury tells us that there are none so little dependent on the individual or under the control of his will. Suicide in the vast majority of cases is a consequence of mental derangement, and in such cases the rational will is deposed from its supremacy, and allows impulse to reign supreme. Whatever theory we may hold respecting madness or its causes, it is not unfrequently the result of disease in the brain, which can be actually detected. Suicide, therefore, belongs to the order of physical phenomena, and not of moral ones.

Mr. Buckle seems to have fallen into the inconceivable mistake of having confounded will with impulse.

I concede to him the fact that men are not usually goaded to commit suicide by companions—i.e., they are seldom directly tempted by them to do so. But what has this to do with the matter? Are no actions voluntary which we are tempted to do at the suggestion of others? But Mr. Buckle's assertion

is only true in a very limited sense. Although our companions seldom tell us to go and hang ourselves, yet, notwithstanding this, men are often goaded by their companions to commit suicide; as, for example, a wife by a drunken husband, and *vice versâ*. "Nor," says he, "are they interfered with by any external association which might hamper what is termed the freedom of the will." I reply, are not men driven to commit suicide under the overwhelming influences of misfortune, despair, and the breaking-down of their mental constitution? Of all the acts of man, none are so entirely beyond the control of his will; and to quote the uniformity of suicide as shown by statistics as a proof that the will is powerless of all influence in human affairs, is exactly one of those things of which a schoolboy would exclaim, "That is good!"

One more proof on which Mr. Buckle relies to support his theory that the influence of the will in human affairs is a vanishing quantity, is the uniformity of moral law as proved by the statistics of marriage. I am sorry to tell every lady and gentleman present that his individual will never has nor ever will exert any real influence in this matter; but that we have been and ever will be determined by a succession of hard antecedents and consequents, over which we can exert no control. This is certainly a glorious gospel to have proclaimed in our ears in these latter days. But what is this all-constraining influence, in the name of which we are invited to believe that in this especially delicate matter we have no free agency? I am afraid that you will think that I have misrepresented Mr. Buckle, and I will therefore quote his own words—"It is now known that marriages bear a fixed and definite relation to the price of corn; and in England the experience of a century has proved that, instead of having any connection with personal feelings, marriages are simply regulated by the average earnings of the great mass of the people; so that this immense social and religious institution is not only swayed but is completely controlled by the price of food and the rate of wages."

Ladies and gentlemen, the gospel according to statistics and the Positive philosophy, if it is rightly interpreted by Mr. Buckle, is truly to you a gospel of good news; but I suspect, after all, that the evidences on which it rests are not so strong as to deprive us of all belief in the four Evangelists. You who wish to procure wives or husbands need not for the future trouble yourselves about any endowments, mental or bodily. The whole matter is regulated for you by causes over which you can exert no control. You are absolved from all attempts to please. You need not consider suitableness of

character or agreement in your tastes. All those influences on which we were foolish enough to imagine that our happiness depended have vanished under the new dispensation. Nay, even sentimentality and caprice must count as nothing in this most momentous affair of life for ever and a day. We have no will about the matter, either rational or otherwise; and in thinking that we ever had, we have been under the fondest of delusions. Mr. Buckle informs us that, under this new dispensation, "this great social and religious institution is not only swayed but is completely controlled by the price of food and the rate of wages," and that "the experience of a century in England proves that marriages have no connection with personal feelings." No sensible man will entertain a doubt that the number of marriages in any particular year is affected by the general prosperity of the country; but one would have thought that the giving utterance to such a paradox as that "marriages have no connection with our personal feelings, and that this great social and religious institution is not only swayed but is completely controlled by the price of food and wages," would have caused any man to pause and question the truth both of his principles and conclusions. If such has been Mr. Buckle's experience in the matter, I can only say that it flatly contradicts my own; and as long as my powers of memory continue unimpaired, I shall reject the conclusion which Mr. Buckle draws from his statistics. I must again take refuge behind my former objection, that the statistics include the action of our individual wills, our likes and our dislikes, our sentimentalities and our fancies; and they will only avail to prove Mr. Buckle's point when he has succeeded in eliminating every one of these out of the problem; and when he has got rid of all these variables, his statistics will assume a different character, and we shall be able to go on in years to come as we have in those which are past. It is more than any one of us can believe, that we are bound by as iron a law in the matter of marriage as nature is by the doctrine of the parallelogram of forces; and that neither free will nor caprice exerts any influence over this great social and religious institution.

In a similar manner we are informed that the numbers of the letters lost in the post-office bear nearly the same ratio, year by year, to the numbers of the population. What this has to do with proving the powerlessness of individual influence on the great total of human affairs I cannot tell. It very seldom happens that any of us drop a letter into the post-office with a bank-note in it without a direction, or putting our own name and address, deliberately and of set purpose. When

we drop one in inadvertently, a powerful action of our individuality usually takes place as soon as we have discovered it, and we do not quietly resign ourselves to the necessary action of a set of antecedents. One thing, however, Mr. Buckle consistently persists in forgetting—that to give his arguments the smallest efficacy to prove his conclusions, the ratios must not be nearly similar, but invariably the same. At any rate I must put in a claim on behalf of free-will for the difference.

But Mr. Buckle by no means confines himself to the use of statistics. He considers that man's physical position in this or that particular country exerts a nearly inevitable influence in determining his condition for weal or woe, and that the individuality, or what we call the will, of man is powerless to resist the external influences in the midst of which he is placed. He has endeavoured to prove this by a large induction ; but it should be observed that, like multitudes of persons who are blinded by theory, whether theologians or philosophers, he has forgotten to take account of those which make against him.

Mr. Buckle is of opinion that man's local position has exerted an overwhelming influence over his early civilization, and that it has made him what he is. If we knew the precise nature of the one, we could invariably determine that of the other. He has nowhere defined the term civilization ; but it is evident that he includes under it, not only what we commonly mean by it, but the whole of man's intellectual, moral, and religious developments, which I shall designate by one single word, his idealization. Mr. Buckle has explained, at great length, his views of the influence exerted on civilization by the natural products of the soil, the heat of the climate, and the physical phenomena to which each particular country is subject. These influences impress themselves on the character of the inhabitants with a force which no act of their individuality is able to control. Each great race of the ancient world was made by them what it was. The climate has determined the kind of food, and the latter has left an indelible impression on the national character.

The early civilizations originated in regions whence food was easily attainable. In proportion to the ease with which it could be procured, has been the rapid development of the particular form of its civilization, and its subsequently stunted growth. Exuberant fertility of the soil has been far from a blessing to man. To causes of this description he traces the civilization of Babylonia, Assyria, Egypt, India, Mexico, and Peru. But he forgets that, in accordance with his theories,

these causes ought not only to exert a general operation, but to produce an absolute uniformity of result, not only in their great outlines, but in the minutest details. In proportion as the supply of food is large, and attained by a small amount of labour, in the opinion of Mr. Buckle, national degradation is the inevitable consequence. He introduces the state of Ireland in the days of plentiful potatoes as a striking illustration. It seems, however, never to have occurred to him that some of the great peculiarities of the Irish race, which still exist with no inconsiderable force, were certainly as ancient as the days of Cæsar, and how much higher is their antiquity we have no certain testimony of history to determine. It is impossible, therefore, to account for these peculiar traits either from the influence of potatoes or that of the Roman Catholic religion, whatever both these causes may have done to aggravate them in the case of the Irish people. Perhaps, however, Mr. Buckle will say that the Caucasian race was cursed with a superabundant supply of food before they left their original abode in Asia. But as there is no evidence of this as an historical fact, this would be to prove one theory to be correct by inventing another. If that were conceded as legitimate, Mr. Buckle would have to show why these causes have not produced similar results on the German race.

Mr. Buckle ascribes the moral and political evils of India to the ease of the production of rice and raki: those of Egypt to the date. They stand to one another in the relation of cause and effect. "In India," says he, "abject, eternal slavery was the natural state of the great body of the people. It was the state to which they were doomed by physical laws utterly impossible to resist. The energy of those laws is in truth so invariable, that whenever they have come into play they have kept the productive classes in perpetual subjection" (p. 73).

Mr. Buckle, however, admits that the case of Brazil is against him, and numerous other examples which would greatly modify his theory he passes over in silence. Brazil, notwithstanding its apparent advantages, has always remained uncivilized. His explanation is curious. It may be a piece of very fine writing, but, to my mind, it entirely misses the mark. "Amidst the pomp and splendour of nature," says he, "no place is left for man; he is reduced to insignificance by the majesty by which he is surrounded" (p. 95). I reply, Brazil is an immense country. Is everything in it majestic? Is it all pomp and splendour? At least some portions of it exactly fulfil Mr. Buckle's conditions for the presence of an early civilization.

In a similar manner he traces the peculiar aspects of European civilization to the absence of these conditions. Its colder climate and uncongenial soil have created the individual character which distinguishes the European from the Asiatic races, effected the dispersion of wealth, and generated the feeling of personal freedom.

But there is another power to which Mr. Buckle ascribes a potent influence in the creation of the ideas of religion and morality—the aspects of external nature. He divides them into two divisions: those which excite the imagination, and those which affect the intellect. To the former, which he considers the potent influence, he ascribes the creation of the great national religions. On this subject Mr. Buckle has a very striking passage, which I cannot forbear quoting:—

“Man (says he), contrasting himself with the force and dignity of nature, becomes painfully sensible of his own insignificance. A sense of inferiority steals over him. From every quarter innumerable obstacles hem him in and limit his individual will. His mind, appalled by the indefinite and the undefinable, hardly cares to scrutinize the details of which such imposing grandeur consists. On the other hand, where the works of nature are small and feeble, man regains his confidence,” &c. &c. (p. 109).

Mr. Buckle is here theorizing, instead of making careful inductions of facts, and erecting on them only such theories as the facts will bear. He wants to account for the existence of the peculiar form of Asiatic, and, above all, Hindoo idealization. I do not wish to dispute with him that some of the things to which he attributes it have exerted a powerful influence, but to say that they are an account of the whole of the matter is to assume what he ought to prove. There is one country of which he conveniently omits all mention—Judæa, and the peculiar aspects of its civilization.

I ask, does not nature exist on a scale of extraordinary grandeur in other regions besides those whose peculiar civilization he is labouring to account for? Is she not vast in Alpine regions? Where does she exhibit herself with equal grandeur as in America? Is she not grand in Egypt, Assyria, or Babylonia? Yet she has not swallowed up man nor his individuality.

In such causes, according to Mr. Buckle's theories, the great national idealizations in religion and morality have originated. The distinctions between the religious aspects of Greece and India are enormous, and it was necessary that the difference between their physical aspects should be represented as equally wide to enable him to account for them. He therefore paints in very graphic language the terrific aspect

of nature in hot climates, and her milder ones in more temperate regions. He asserts that the effect of earthquakes, hurricanes, pestilences, tempests—the products of hot climates—exert a most disastrous influence on man's moral and spiritual being. One would be almost tempted to think, from his descriptions, that men in oriental countries saw nothing besides them. He even endeavours to trace the superstitious character of Spain and Italy, compared with that of other European countries, to these and similar causes.

I do not dispute the influence of many of these phenomena when they are confined within moderate limits, on the moral and religious character of mankind; but Mr. Buckle, when he mounts a horse, is not satisfied till he has ridden him to death. With him the laws of the moral and spiritual worlds cannot be laid down too universally or too invariably. He attributes the whole of the peculiarities of Indian civilization, including its religion, the peculiar forms of its poetry, its want of all genuine science, and its superstitions, to such influences as earthquakes, hurricanes, tempests, diseases—in a word, to all the terrific aspects of nature, forgetting all the while that there are other countries which are vastly more subject to these influences than India, where the character of the civilization has assumed a very different form. He then contrasts with all these terrors the more favourable position of Europe, and especially of Greece, and endeavours to account for the different aspects of their civilization in conformity with these conditions.

To one passage I must draw your attention as a remarkable specimen of Mr. Buckle's mode of reasoning, and I therefore quote a portion of it:—

“In Greece (says he) the aspects of nature are so entirely different that the conditions of existence are changed. Greece, like India, forms a peninsula; but while in the Indian country everything is grand and terrible, in the European country everything is small and feeble. The whole of Greece occupies a space somewhat less than the kingdom of Portugal, i.e. about a fortieth part of what we now call Hindustan, and dangers of all kinds are less numerous than in the tropical civilizations. The climate was more healthy, earthquakes were less frequent, hurricanes were less disastrous, wild beasts and noxious animals less abundant. The highest mountains of Greece are less than a third of the Himalayas, so that they nowhere reach the regions of perpetual snow.”

Out of these and similar influences Mr. Buckle deduces the differences of the Indian and Greek religions; the monstrosity of the one, and the human character of the other.

This is a singular instance of exaggeration; and of putting *non causa pro causa*. I have no wish to deny that a powerful

influence is exerted on man's religious ideas by the aspects of external nature. On the contrary, I firmly believe that they have contributed greatly to their modification. But this is not enough for Mr. Buckle. They must create them.

I was not aware that everything in India was so great and terrible; nor, although Greece is a small country, that the whole aspects of nature in it were feeble. Earthquakes were certainly not unusual in Greece; I should have thought far more frequent than in India. India is a very large country compared with Greece; but, owing to the difficulties of locomotion, I do not see how its vastness could have been deeply impressed on the minds of its inhabitants. Compared with its size, Greece is certainly a vastly more mountainous country than India. Dangers of all kinds were in the early ages abundant enough in Greece. Its mythic personages are described as the destroyers of wild beasts and noxious animals. The Himalayas are doubtless three times as lofty as the Greek mountains; but as they are situated in the north of India, and the great bulk of her population has always inhabited the great plains of her rivers, it is very unfortunate for Mr. Buckle's theory that they have been invisible to nine-tenths of her population. Mr. Buckle invents a theory, and then the facts to support it. Mountainous scenery must have been a subject of contemplation to a large proportion of the Grecian race; and if the contemplation of it has had any influence on the relative dimensions of gods in Greece and India, those of the former country ought to have been of far more gigantic proportions than those of the latter. But the contrary is the fact. If volcanic phenomena have exerted a potent influence on religion, Italy is certainly a far more volcanic country than India, far more subject to earthquakes, and the religious development ought to vary in proportion. What shall we say of some regions of South America, where these phenomena are of constant occurrence?

The whole of Mr. Buckle's errors are owing to his having started with a theory, to which it was necessary that the facts should be made to square. If true, it would save us from the trouble of a vast amount of painful investigation. Such theorizing is an original sin of the human mind. It is no peculiarity of any one class of thinkers. It behoves theologians watchfully and prayerfully to guard against it, no less than philosophers and men of science. It is not only mischievous in its false assumptions, but it poisons what is true in their respective systems.

I can hardly resist the temptation to enter on another most important portion of Mr. Buckle's philosophy of history—the relationship in which the development of man's intellect and

rational powers stands to his moral and spiritual being; but the length to which this paper has already gone prevents me from even scratching the surface of the rich mine of matter contained in these volumes on this subject. I will, therefore, only notice one most serious conclusion which Mr. Buckle thinks that he can deduce from the philosophic study of history in connection with it.

Mr. Buckle assigns the whole of man's improvement in civilization to one single power—the development of his intellectual faculties. I am far from wishing to dispute with him the mighty influence for good which the intellectual development of man has exerted. But Mr. Buckle will have it to be the only influence. In trying to establish this, he is induced to depreciate the influences which have been exerted by religion and morality; and, to make his position good, he is compelled to misrepresent Christianity itself. It is impossible to read this portion of his work and not to feel that Mr. Buckle has not hesitated to carry out his principles to those consequences. A one-sided theory has led him to mis-state facts.

Mr. Buckle's errors originate in his love for enormous generalizations, and his wish to trace everything to the influence of a single principle. Many of his propositions would be true enough if he would only state them with a large amount of qualification. But, instead of assigning a very important influence to the intellect on the development of our race, he endeavours to show that it is the only principle which has exercised an influence for good. His desire to prove this leads him habitually to depreciate the effects of the religious and moral influences which have been brought to bear on mankind. His language on these subjects is all the more dangerous, because it not unfrequently possesses a certain portion of truth. Thus, at p. 165, after having told us that intellectual acquisitions are carefully preserved in civilized countries, while the effects of good deeds speedily perish, he adds, that "although moral excellence is more amiable, and to most persons more attractive, than intellectual excellence, still it must be confessed that, looking at ulterior results, it is far less active, less permanent, and, as I shall presently prove, less productive of real good." He then adds, "These conclusions are, no doubt, very unpalatable; and what makes them peculiarly offensive is, that it is impossible to refute them." He then tells us that ignorant good men always do more evil than good; and that, whenever their intentions have been eager and the power extensive, the evil has been enormous. Still more offensively he adds, that "if you can diminish the sincerity of a man and mix up some alloy with his motives, you will diminish the evil which he works."

"If," says he, "he is selfish as well as ignorant, it will often happen that you may play off his vice against his ignorance, and, by exciting his fears, restrain his mischief. But if he has no fear, if he is entirely unselfish, if his sole object is the good of others, if he pursues that object with disinterested zeal, then it is that you have no check upon him; you have no means of preventing the calamities which an ignorant man in an ignorant age would be sure to effect." Mr. Buckle then at great length travels through the history of religious persecutions and other kindred subjects for the purpose of supporting these moral paradoxes, endeavouring to show that many of the vilest persecutors have been men of the purest virtue, and if they had been only less pure, they would have done far less mischief.

It would take me far more space than I can possibly give to it at the end of this paper to disengage the truth in these statements from the falsehood, and to point out the nature of the sophistries which are involved in his reasoning. To do so would render it necessary that I should investigate the first principles of the whole subject, and lay down the relation in which the intellect and the reason stand to our moral nature. One thing, however, it is obvious that Mr. Buckle habitually overlooks. Intellectual greatness or intellectual power never exists independently of a moral character of some sort. The intellectually great man must be either a morally good man or a morally bad one, or occupy an intermediate position. To distinguish between these two factors, though possible to our powers of abstraction, is not possible in fact. His view of the character of religious persecution requires great modification, and his inductions of facts are not always happy. It is perfectly true that Marcus Aurelius persecuted the Church, though certainly not under the inspiration of any great zeal for the worship of Jupiter; and that the wretched Commodus and Elagabalus abstained from doing so. But is it a fact that all good emperors were persecutors, and that all bad emperors abstained from persecution? Nothing short of this will sustain Mr. Buckle's position in the objectionable form in which he has placed it. I answer that Alexander Severus was nearly the best, if not the very best man who ever sat on the Imperial throne, and he tolerated Christianity. Maximin was an utterly bad man, and Galerius little better, though the latter was not destitute of some enlargement of mind, and both proscribed it. Diocletian also was not destitute of considerable mental qualifications, and he and Galerius assailed the Church with the most terrible persecution which she encountered during the continuance of the Roman Empire. Queen Mary was a moral but narrow-

mindful woman, and her case would help to support Mr. Buckle's theory; but Henry VIII. was a man of capacious intellect and far less morality, yet he was equally a persecutor with his daughter. Francis I. was both sufficiently intellectual and immoral for Mr. Buckle's purpose, but neither of these qualities saved him from the guilt of ruthless persecution.

I will place the issue of this part of the subject in one plain answer to a plain question, under the full assurance that, had Mr. Buckle been living, his answer must have been, even on his own principles, adverse to his own theory of the comparative nothingness of moral and religious influences compared with intellectual on the grand total of human affairs. The question which I am going to ask respects the great Author of Christianity himself. What has been the degree of influence which He has exerted? Has it been an intellectual or a moral and spiritual one? His great act of self-sacrificing love is beyond all question a moral and spiritual influence. Will Mr. Buckle deny that it has been a mighty one? He may say that he does not believe in it, but that does not affect the mighty power which, whether it be true or false, it has exerted. Will Mr. Buckle find any intellectual influence equally mighty as this great moral and spiritual power, which has for nearly two thousand years mightily swayed the minds of men? Mr. Buckle may tell us that moral influences speedily perish, while intellectual ones endure. Will he point out any intellectual influence which has been equally powerful and enduring as the great moral and spiritual act of the self-surrender of His life, which has been exhibited by Jesus Christ? Mr. Buckle's theory is ground to powder by the terrific pressure of the falling upon it of the Head Stone of the Corner.

One more reference, and I have finished. Mr. Buckle says at page 233 :—

"Men of excellent intentions, and full of a fervent though mistaken zeal, have been, and still are, attempting to propagate their own religion among the inhabitants of barbarous countries. By strenuous and unremitting activity, and frequently by promises and even by actual gifts, they have in many cases persuaded savage communities to make a profession of the Christian faith. But when we compare the triumphant reports of missionaries with the evidence supplied by competent travellers, we soon find that such profession is only nominal. . . . After the careful study of history and the condition of barbarous nations, I do most confidently assert that there is no well-attested case of any people being permanently converted to Christianity, except in those very few instances where missionaries, being men of knowledge as well as men of piety, have familiarized the savage with habits of thought, and, by thus stimulating his intellect, have prepared him for the reception of

those religious principles which, without such stimulus, he would never have understood."

The fallacies in this passage are enormous. No intelligent Christian, I apprehend, ever means to gainsay the importance of a development of the intellect as a preparation for the reception of Christianity. To do so would be to treat with contempt the course of training to which the providence of God subjected the Pagan world before the Gospel of Christ appeared in the fulness of the times. In the course of Divine Providence, and under the influence of the preparation which it effected, Christianity was, in the earliest stages of its growth, preached to one of the most intelligent races of men. The importance of an intellectual preparation every intelligent Christian will fully concede to Mr. Buckle.

But what does he mean when he speaks of a barbarous country? The expression is extremely indefinite. Does he mean by the term "barbarian" a man sunk to the lowest level to which man has ever degenerated; or a race like the New Zealander, or the Polynesian, or the German barbarian, when he rushed on the Roman empire, and by the infusion of his blood regenerated its worn-out races; or the ancestors of the modern Magyar, or the Russian? Or again, what does he mean by the expression, "being permanently converted to Christianity"? In one sense of that term no nation ever has been permanently converted to Christianity—in the sense of every member of it having become perfectly obedient to the law of Christ, or perfectly comprehending the whole of its sublime teaching. I quite agree with Mr. Buckle that "the rites and forms of religion lie on the surface. It is the deeper and inward change which alone is durable." I again ask in what sense does Mr. Buckle use this term? for if he employs it in the sense of the full embodiment of the Christian law in the national life, he is only stating a truism. But, however he may have confused himself, his language conveys a very different meaning. I apprehend that he really pledges his historical knowledge to the fact that Christianity has never been permanently embraced by an uncivilized people—a people, in fact, which can be designated by the vague but popular term "barbarous," unless they have been subjected by the missionaries who have preached to them to a long course of intellectual training, and he attributes every appearance to the contrary to a species of bribery systematically pursued by zealous but mistaken men. Although Mr. Buckle's pages are encumbered with notes and with references, it is a singular fact that the page in which this charge is made is destitute of any. The whole of Mr. Buckle's mis-

statements on this point proceed from the fact that his theory compels him to ignore the moral and spiritual element in religion. I wish not to say one word in depreciation of an intellectual development as a preparation for the preaching of Christianity. I simply assert that Christianity possesses a mighty moral influence which is capable of speaking to the heart of a barbarian or a savage; and that while Christianity possesses truths suited to the loftiest intellect of man, it possesses truths so simple that none can be so easily addressed to the humblest states of the human mind, or are so calculated to exercise over it a civilizing influence. The bare reception of them at once softens the savageness of the human heart, and exalts the degraded intellectual powers. When, therefore, Mr. Buckle pledges his reputation as an historian that no barbarous nation has ever been converted to Christianity except under the conditions which he asserts, he imperils his literary reputation, and proves that he has read history with a veil of prejudice extended before his eyes, which has darkened the clear light of truth and damaged the distinctness of his intellectual vision.

The CHAIRMAN.—I am sure you will cordially vote our thanks to Mr. Row for his excellent paper (hear, hear); and now I shall be glad to hear any gentleman who may wish to speak upon it.

Mr. WARINGTON.—To do anything like justice to such a paper as this, and especially to take up the line of discussion which I should have liked to do, would take so long a time, and would lead to so much comment from others, that the discussion would be prolonged beyond all reasonable limits. But there are one or two points on which I must say a few words; and first with regard to that fundamental question, the freedom of the will. On that subject I should be disposed to take a view much nearer that of Mr. Buckle than that advocated by Mr. Row. I would ask this simple question: Is it a fact that my will is really free, and that I am completely master of everything I do? If that is so, it is possible for me, simply from powers innate in myself, to do everything that is right. There can be no such thing in my nature as a power for evil which I cannot overcome, if my will is paramount. If my will is absolutely free I can choose for myself every time that a question comes before me as to what I am to do. I can choose absolutely what course I will take, and thus it would be possible for me, and for every human being living, to be absolutely good and pure and holy. (No, no.) If my will is free, that must be so; it is a necessary consequence. But I know well that a negative answer must be given to that, for I am certainly not able to be absolutely good and pure and holy so long as I am left to my unaided self. The inference, then, is inevitable that my will is not absolutely free——

Captain FISHBOURNE.—It is free only to the limit of your own power.

Mr. WARINGTON.—Then it is not wholly free, for, as you admit, there is a limit. I appeal to the highest authority on the subject, and I find, in the

seventh chapter of the Epistle to the Romans, an inspired Apostle giving, as the result of his experience, that that which he would he could not. He willed to do a thing, but he had not the power; it was not a physical impossibility, but a moral impossibility. He willed to do a certain thing, but the law of his nature stepped in and said, "You shall not." That law was the master, and he was the slave—his will was not free; it was fettered and bound. I stand upon that as a fact which we are bound to look clearly in the face in forming any theory as to what the will is. Now, how is this limitation of the freedom of will to be explained? In order to explain that, it is necessary to analyze to some extent in what our will consists, and, to prevent misunderstanding, I will exclude all actions which are involuntary, or which are the result of physical compulsion, and, for the present, the influence of conscience also. What is there of will in my nature independent of the consciousness of a sense of right and wrong? What is it, apart from conscience, that leads me to resolve upon any action? I answer that it is my desire for something which shall be attained by that action. I see a book on that table, and I wish to open it. The only thing which impels me to open it is my desire to have it open. I can distinguish in my mind between the desire to open the book and the act of opening it, but between my desire and my will I can see no difference at all:—the one is the immediate outward manifestation of the other. But there may be something else in my mind which leads me not to open the book after all. The book belongs to somebody else, and it is a question whether I ought to open it; whether it would be advisable as a matter of ordinary prudence that I should touch it. Another desire has now come into the field. I desire to keep on good terms, perhaps, with the owner, and I should not like him to be displeased with me for opening it; and so, impelled by that desire, I leave it alone. But you may say I have here made choice between two desires. Nothing of the kind. I have simply two antagonistic desires, of which one is stronger than the other, and the stronger necessarily gets the best of it. The two desires struggle one against the other, and the stronger wins the day—

Rev. Dr. IRONS.—Do you mean to say that there are two distinct entities struggling against each other in your mind?

Mr. WARINGTON.—Certainly not. There are two desires, belonging to different parts of me, but not two entities. So far as my consciousness goes I know of nothing between them, but the two desires are there struggling against each other, and I know of no third faculty holding the balance between the two, and making up its mind judicially as to which course it will adopt. Mr. Row, however, does know of the existence of a third faculty which here steps in. Now, you may complicate the matter as much as you like—you may bring into play a hundred different desires, if you please, instead of only two or three; still I maintain that whichever happens to be the strongest among them is that which is in fact *the will*. These desires are of very various kinds, and affect various parts of my nature—

Rev. Dr. IRONS.—I must say I do not understand you. You say these desires are struggling together, and affecting various parts of your nature. Are they your own desires?

Mr. WARINGTON.—Unquestionably.

Rev. Dr. IRONS.—Then, pardon me, but I do not see exactly what you are driving at.

Mr. WARINGTON.—I think the difficulty lies not so much in what I am driving at as in that against which I am driving—

Mr. REDDIE.—May I ask you a question? Would you be good enough to explain how you can at all exclude conscience from the argument?

Mr. WARINGTON.—I only exclude it for the moment. I shall come to it again presently—

Mr. REDDIE.—But the whole question really hinges upon it.

Mr. WARINGTON.—I will not omit it altogether. I think the difficulty which Dr. Irons experiences arises from this: the theory put before us speaks of desires or motives as one thing, and of the will as another thing. Now I submit that that distinction is one which you cannot possibly make—

The CHAIRMAN.—I think you have imported the word “desire” into the argument, Mr. Warington.

Mr. WARINGTON.—I am only battling against the theory that these desires or motives are separate from what I call my will; I say there is no distinction between will and motive. The will, I contend, is not a separate faculty which weighs the motives against each other, but it is the simple resultant of all the various motives working in my nature, and therefore it is simply the same as the preponderating desires or motives. I do not wish to make any distinction myself. I am merely fighting against such a distinction being made—

Rev. C. A. ROW.—I have used the term “rational will” in my paper.

Mr. WARINGTON.—Now, this is the first step in my argument—that the will is not a separate faculty, but a whole mass of desires or motives working together. I have here no power which I can, properly speaking, call free. My nature is so constituted that when certain things are presented to it, those things, inevitably, by a law of my nature, call into being certain desires, and those desires will come to all men. It is inevitable that they should. I am quite aware that they do not come equally to all men, because characters and dispositions are different. I simply deal with man as we find him. So far as the lower part of man's nature is concerned—what we may call man's soul in distinction to the spirit—it consists of a number of senses capable of being acted upon by external circumstances and things, and, being so acted upon, these then become desires and fight against each other, and thus produce in their action and reaction that which we call the will. We may for the purposes of illustration compare the mind of a human being to the House of Commons. You have a number of members, every one with his own wish and object to obtain, and they ultimately go to the vote, and the result is the will of the House—not a will distinct from the members who vote, but a will formed by the decision of the majority—

Rev. Mr. GREIG.—May I ask, is not that will free?

Mr. WARINGTON.—I submit that those desires are not free—they are bound in the way which Mr. Buckle has described. There is no physical compulsion of the will, but there is the compulsion of circumstances calling

up certain desires. Is there any power in my nature capable of willing and controlling them? If there is, I am free; if I can show that there is a faculty above them all in me, then I am free. Now, there is a faculty in man which claims to do it, and that faculty is conscience; but I submit that conscience has not the power to do what it thus claims. Sometimes, indeed, conscience seems to have the power, because it is able to call up and set in motion other desires of the lower man which will counterbalance those already in motion. A man desires to commit a theft, but the voice of conscience tells him that that is wrong, and stops him by calling to mind the punishment which will ensue if he carries out his desire. In that case the desire to avoid the punishment is greater than the desire to thief. It is not that conscience alone has the power, but conscience calls up another power which really effects the work. A man drives a number of horses attached to a coach, with reins for each horse. If he had no power over the reins you would say he had no power over the horses. If he guided them merely by holding a bundle of hay before them you would not say he had much power over them, and that is very much the same sort of power that conscience has over the human soul, merely calling desires into action, but having no real power to control them. The Apostle Paul's conscience was of this kind. He desired to do that which was good, but he could not do what he wished. He was the slave of his human nature. But you will say, "Here is still a consciousness within myself that I am free, and need not do anything unless I like. Here is a sense of responsibility." Precisely so: this sense of responsibility is the key to the whole position. This sense of responsibility shows that there is some restrictive voice within us telling us what is right and what is wrong, and so convincing us that the reason for doing wrong is in ourselves. Man falls, and the fault is in himself, and yet he cannot help it, which shows at once the fact that conscience has not the power it ought to have. Yet still is he responsible; for it is his own nature that makes him do wrong. But our conscience, or our sense of responsibility, does not stop there. It tells us also that we might have done something different from what we did, and I conceive that that is to be explained on a far higher ground than any Buckle has thought of, or than we have heard hinted at in Mr. Row's paper. Man is conscious that there is a power within his reach that would enable his conscience to be the master, but that power does not lie in himself—it is far above him. Man is conscious of that intuitively. It is one of the instincts implanted in his nature that there is a divine power hovering about him, and which, if he grasps it, will make his conscience master of his whole nature. Then, if he grasps that spirit of God above him, he ceases to be a slave,—he is free. He is no longer a slave to sin and his own desires—he is free. In no other sense is man free. He has freedom within his grasp, he can choose it, he can stretch out the hand of faith and clasp it if he will, and so become master of himself. Man can refuse the proffered freedom if he will: he did refuse it once, and he fell; but by clasping it again he rises. And there is the responsibility. He can refuse to take that help from God which he feels so near him, and so he may allow his lower nature to be master; but on the other hand he may accept that help—

Mr. REDDIE.—Which you admit he is free to take.

Mr. WARINGTON.—Yes, which he is perfectly free to take, and therefore in that sense, and in that sense only, man is free. With Divine help he may be free in everything; without it he is free in nothing. I differ *in toto* from Buckle's conclusions on that point, although I admit a vast number of his premises, because he has ignored the essential point of man's conscience and its contact with God's spirit. St. Paul says, "Oh, wretched man that I am! who shall deliver me from this bondage?" and again, "I thank God, *through* Jesus Christ." He felt the bondage and he found the freedom. I do not therefore deny freedom to man, for I admit his full freedom in one particular, which, if only used aright, would give freedom to his whole nature in the truest and highest sense possible.

Rev. Dr. IRONS.—I do not intend to neglect altogether the observations of Mr. Warington, but I think it is a preliminary duty to lead back our thoughts to the paper which has been read, and which was not wholly confined to the question of the freedom of the human will. The paper deals with the philosophy of Mr. Buckle as well as with certain propositions contained in his works. All the reviews which have handled the remarkable books of Mr. Buckle have failed to notice their connection with that movement in France, and existing to a less extent in England, known as the "Positive Philosophy" movement. Mr. Buckle appears to have been an exponent of the principles of M. Auguste Comte with reference to his historical hypotheses. Man's whole history is such a concatenation of events that it could not have been other than it was, says M. Comte; and, in order to prove that, it was the intention of Mr. Buckle to construct a history of civilization on a gigantic scale; and nothing but the fact that Providence cut short Mr. Buckle's career arrested the progress of that work. But, to carry out his principles of history, he was bound to encounter the theory of human free-will. On that point Comte parted company with some of his distinguished disciples. He began his system without intending, so far as I can see, to construct a new religion—what is called "the religion of humanity." But Buckle's *History of Civilization* was to be the development of Comte's whole theory; and it was therefore necessary for him to deal with the fact that man is supposed to have a will. He, therefore, lays down this proposition, that there is no such thing as will possible, because order and law preclude the idea of that variability which is included in the idea of will. He not merely denies the freedom of the will, but he denies its existence; and not merely the existence of variability or will in man, but even in God;—and from that Comte proceeds to deny the being of a God. Mr. Buckle seems to hesitate as to accepting that conclusion, but he adopts all Comte's premises which lead up to it; and in the same way we find that many of the followers of Comte, and companions of Buckle, adopt the same class of premises, while arriving at somewhat divergent conclusions. For example, the Duke of Argyll, whom we may consider as a sort of follower of both Comte and Buckle, hesitates to adopt their conclusions; and his book on *The Reign of Law* falls very far short of the views of the more advanced

Positivists. So, again, Mr. Lewes adopts the former part of the philosophical and historical theory which Buckle was working out ; but he stops abruptly, and rejects with something like scorn the theory of a religion of humanity. There is no such thing as a consistent follower of Comte ; but there is a large number of quasi-philosophers who adopt those principles of Comte which cannot but lead to a denial of the existence of free will both in man and in God. Mr. Row a little offended me in his paper, by conceding rather too much to Mr. Buckle at the outset. He conceded, with a facility that gave full scope to Mr. Warrington's argument afterwards, that we really are impelled by motives, that they always go before, and are not merely our reasons, and that they have thus a distinct power as entities acting upon us. I have an objection to the use of abstract terms on such a point. We talk of memory and reflection. But my mind is no more made up of memory and reflection, than my leg is made up of walking and running. I am not something made up of memory, and of other faculties—I am a single being, a unit. What a thought is before I think it I do not know. Man is, in short, an intelligent cause of action ; and it is misleading to take certain useful abstractions, which are harmless and necessary in ordinary conversation, in order to construct a philosophical theory upon them, when those abstractions will not bear critical analysis in the manner in which they are applied. Mr. Row concedes that motives act upon human beings. Now, I say I never was acted upon by a motive. All these abstractions are merely convenient terms for describing the mind of man acting in a certain direction. Mr. Row quotes from Mr. Buckle :—

“The only positions which, at this stage of the inquiry, I shall expect the believer in the possibility of the philosophy of history to concede are the following : that when we perform an action, we perform it in consequence of some motive or motives” ; (what rubbish !) “that these motives are the results of some antecedents ; and if we were acquainted with the whole of the antecedents, and with all the laws of their movements, we should with unerring certainty predict the whole of their immediate results. If, for example, I am intimately acquainted with the character of any person, I can frequently tell how he will act under any given circumstances.” (Here he has got a truth : common sense will speak out now and then.) “Should I fail in my prediction, I must ascribe my error, not to any arbitrary or capricious freedom of the will” ; (why *capricious* freedom of the will ?) . . . “but I must be content to suppose, either that I had been misinformed as to some of the circumstances, or else that I had not sufficiently studied the ordinary operations of his mind. If, however, I was capable of correct reasoning, and if, at the same time, I had a correct knowledge both of his disposition and of the events by which he was surrounded, I should be able to foresee the line of conduct which, in consequence of these events, he would adopt.”

Poor man ! Yet I suppose his friends think him a sound and deep thinker ! We now pass from Buckle's theory of the will, which is hopelessly encumbered with the notion that abstract ideas have a concrete existence, and so act upon the man, to Aristotle's seventh book of Ethics ; and here I must thank Mr. Row very much for referring to that. I believe that book is one of the most perfect pieces of composition in the world. It has its faults ; but we must bear

in mind that Aristotle was himself encumbered by the theories of his predecessors. He had not a clear field for his own philosophy, and from the very little he says in his *Ethics*—as to the *ἔκθεσις*—as to the principle of will in man, we cannot suppose that he had a clear conception of the doctrine, which we as Christians hold, that man is a really responsible being, in any higher sense than that he is responsible to society. That he held that man was responsible to society, and had what we should call a political responsibility, may be gathered from the fact that he considered ethics as wholly subservient to politics. I throw this in by way of protest against making too much of the opinion of Aristotle in the matter. Mr. Row has spoken in very just terms of Buckle's proposition that Christianity has added nothing to the moral progress of mankind, or even to the ethical ideas of the world. But I think he should in justice to Buckle bear in mind that that author was cut off before he arrived in his work at a fair consideration of the moral position of the world in the first century of the Christian era. A thoughtful and careful examination of that period, terminating about the time of Philo, must, I am sure, in a writer of his fairness, have led to a favourable conclusion in his mind as to the addition which Christianity has made in this matter. We should not speak in very strong terms, therefore, of Buckle's views on that point, on which, by the way, our Positivist friends are not much agreed. No two of them have a consistent theory as to what Christianity is. They are bound to deal with it; it is a fact which cannot be set aside; and it has exerted a greater influence upon the whole progress of humanity *de facto* than any other set of opinions or principles with which the world is now acquainted. There must be some philosophy of Christianity propounded by these men sooner or later. I am most thankful that the Christian world is not shrinking from Comte and Buckle and their compeers, and I am glad that the council of this institution has thought fit to bring this subject before us in connection with this thoughtful essay of Mr. Row's. And this is not the last time we shall have to deal with it, for, undoubtedly, the Christian Church will have to grapple with the Positive philosophy. We must not suppose that this school of thought, which has been slowly growing for many years, will come to an end without a great struggle. But if all thoughtful Christians will approach it in a right spirit, and with sound reason, the result cannot be at all doubtful.

Rev. J. TITCOMB.—I think the philosophy of Buckle, as propounded in his *History of Civilization*, has hardly been dealt with as fully as it might be. Mr. Buckle contends that the actions of men are not dependent upon or the product of volition, but of antecedent circumstances, and he carries out that theory, in the most exaggerated way, to the extent of saying that all the suicides committed in the world are absolute cases of necessity. He says, "Suicide is the effect of the general condition of society, and the individual felon only carries into effect what is the necessary consequence of the preceding circumstances." Words can scarcely be stronger in endeavouring to show that what we consider voluntary acts are not the result of mere volition, but of antecedent circumstances; and Buckle bases his conclusion upon metaphysics

and statistics combined. So far as the metaphysical portion of the question is concerned, he argues that like causes will always produce like effects, and that one man, under a similar condition of circumstances with another, will invariably do exactly similar things,—*ergo*, there can be no freedom of the will. Circumstances rule us, and we are bound to pursue a particular course of action, whether we will it or not, according to the state of the antecedent circumstances. But I utterly deny the abstract and moral possibility of there ever being any state of circumstances between any two men identically alike. Take even the case of two men of the same age and surrounded by corresponding external circumstances. Just as in the case of a chessboard, with its sixty-four squares, you have a wonderful number of combinations in playing the game, and the combinations would be marvellously increased if you had 664 squares instead of 64; so you have your combinations inconceivably multiplied *ad infinitum* between the two men in the grand game of life, and there never can be any state of circumstances which can perfectly assimilate them. Only look at men's faces. There are three millions in London, and yet no two of them are alike. I put the freedom of the will in this way: I take the measure of the variation which exists in reference to these faces to be a measure of the free will which each of those men holds and exercises for himself. With regard to statistics, Mr. Buckle brings forward a number of statements with reference to murders, suicides, miscarried letters, and so on, and he argues that because there are general uniform averages among them, there can be no freedom of the will. Mr. Buckle is called a deep thinker, and in many respects he is; but no man can be a really profound thinker who generalizes hastily, and I certainly hesitate to call Buckle the profound thinker that some people dub him. So far as his statistics are concerned, I have no doubt we could carry them out, not merely *usque ad nauseam*, but *usque ad absurdum*.—I utterly deny that marriages, for instance, are mere results of the price of corn and the amount of wages paid in the country; and that the will of the individual has nothing to do with it. That is a complete *non sequitur*. When I married, I am sure it was not because the country was more prosperous: it was because I became the incumbent of a church, and was able to marry. (Laughter.) But Mr. Row has scarcely done Buckle justice in one passage. He quotes from Buckle:—"These assumptions are: that there is an independent faculty called consciousness, and that the dictates of that faculty are infallible;" and Mr. Row observes, "I find a difficulty in conceiving how a man of Mr. Buckle's reasoning powers could have written this passage. I apprehend that in any strict meaning of language it is incorrect to designate consciousness a faculty." But that is the very thing that Buckle himself says. He says, "It is by no means certain that consciousness is a faculty;" and further, that "some of the ablest thinkers have been of opinion that it is a natural state or condition of the mind." Mr. Row goes on to say:—

"It involves an unspeakable confusion of thought to speak of all consciousness as infallibly true. If such an assumption has been made, I agree with Mr. Buckle that it is utterly contradicted by facts. But to say that

all consciousness is infallibly true is to confound between our consciousness of a perception, or a subject of thought, and the truth or falsehood of the perception or the thought—i. e., between consciousness and the object of consciousness."

Now, this is what Buckle himself says upon the word infallibility :—"This requires explanation. Consciousness is infallible as to the effect of its testimony, but it is fallible as to its truth." I think Mr. Row has not done complete justice to Mr. Buckle on these points, but in every other respect I highly approve of his paper.

Rev. Mr. GREIG.—I agree very much with most of Mr. Row's statements. The whole question of Positivism turns upon the question of free will. Is there a will or a personality in man? If there is, Positivism is false; if not, it is true. I should be rather inclined to oppose some of the views expressed by Mr. Warington. I think he was mistaken, for instance, as to the amount of free will for which its advocates contend. We do not contend for absolute free will, because, according to our ideas, only God can possess it. I have the will to think one thought rather than another, and to choose one course rather than another, but I have no power whatever to think or not. I must think: I have control over my thoughts, but I must think, and therefore in that respect I am not free. I am only free within certain limits; absolute freedom is what we predicate only of Almighty God. Then Mr. Warington says there is no such thing as conscience sitting in judgment in the mind—that the mind could not be separated from its desires, and made to sit in judgment over them. Now, that is a most important point, for if Mr. Warington's is the correct view, then of course Positivism is true. I was lately reading a most interesting book upon materialism, in which the author says that materialism altogether breaks down before that tremendous fact of self-consciousness or reduplication in man. We cannot account for that fact on any principle of materialism. I believe the one thing which distinguishes the mind of man from that of the inferior creation is found in that great principle of reduplication. If you grant that fact, you must instantly grant the freedom and personality of man, and if you deny it, you are brought into the Positive school of thought. Mr. Warington has given us some statements which it would be very difficult to answer. It is a curious fact that you cannot prove human freedom, because the position which you take up to prove it presupposes that you are not free. You are obliged to argue "Why do I do such and such thing?" and the very question supposes a cause for your action, which goes against the principle of free will. But I think Mr. Warington would find a difficulty in carrying out the theory he has advanced, unless he adopts the principle of personality and freedom. We are merely slaves because of the Fall. We are merely in a state of bondage, and we can only be relieved from that bondage by the introduction of a higher principle. But the very consciousness that we need that higher principle presupposes, to my mind, that freedom which Mr. Warington denies. I may perhaps be doing Mr. Warington an injustice, as I confess I was not altogether able to follow him in all his observations.

MR. REDDIE.—I think Mr. Warrington has to a great extent answered himself. When he spoke of the enlightenment of the conscience through obtaining the aid of God's spirit, and when he said that man was free to ask for that aid, and to accept it or refuse it, he was really proving that man is a free agent, which is metaphysically a more correct expression than to speak of man's free will, inasmuch as when the "will" is once determined, it is a definite thing, and there is no choice afterwards. "Free will," therefore, is not an accurate, although it may be a good colloquial phrase. We should rather predicate of man's personality and freedom, free agency. Man is free to will, but when he has once determined his will, each volition cannot be any other will than it is, though upon reflection he may change and will otherwise. Mr. Warrington says that a person's conduct in exercising his will is solely dependent upon circumstances. But that is only true with great qualification. Some influence of circumstances is not denied. What Mr. Row and others who contend for free agency argue is, that man can choose one of two things, and that is what is told us in Scripture itself, the highest of all authorities. It was exactly a *crux* of that kind, arising from circumstances, which our first father Adam had placed before him; and Mr. Row very properly brings out the great importance of that which Adam failed to keep in mind when he fell from his original perfect freedom—that is, the importance of faith. It is not quite true, however, that faith was only taught by our Blessed Lord. The great revival of faith in God, no doubt, was due to Him; but it was the faith of Abraham and of Enoch, and of the patriarchs of the Old Testament who went before; and it was because Adam failed in faith in God, and believed what he ought not, that he made a wrong choice, and ate the forbidden fruit. Every circumstance under which the human will has to act turns upon some such choice as that which was made by Adam. The voice of God, even when given externally, as it was to Moses, can only operate on a human being when it touches him internally; and if man has the power by his conscience, to any extent, of knowing right from wrong, he has that very faculty within him which ought to determine his choice; and it is when he hears, or neglects to hear, that inward voice, that he becomes innocent or guilty when he acts. That is also the nature of the power given to man by the Spirit of God, and of the freedom proclaimed in the Gospel for whomsoever will receive it:—"Whosoever will, let him come"—"ask and ye shall receive." But unless Mr. Warrington is prepared to assume that the heathen were totally dark in their consciences—that they did not know right from wrong at all—he must admit the existence of conscience in their case also; for it cannot be got rid of—

MR. WARRINGTON.—I was endeavouring to point out in which part of human nature it lay.

MR. REDDIE.—But you cannot cut up your nature into parts—

MR. WARRINGTON.—I find it is divided in the New Testament.

MR. REDDIE.—Only in a certain sense; not as used by you. Take the case Mr. Warrington suggested as to opening the book, and let us suppose it to have been a forbidden book. There is a French picture now in the

printsellers' windows of a forbidden book being looked at with very great gusto by two young ladies; and every one can understand the story conveyed in the picture. But conscience must have been present in the minds of those ladies as well as curiosity; and as we listen to the voice of conscience, and determine to do what is right or wrong, so are we guilty or innocent. If St. Paul describes the natural man as in a state of darkness, the slave of ignorance and passion, he also most emphatically asks his converts, What did hinder them that they should not obey the truth? Consequently, unless you are prepared to deny the voice of conscience altogether, contrary to what St. Paul teaches,—unless you deny that even nature itself teaches us to distinguish between right and wrong,—Buckle's philosophy and Mr. Warington's principles must alike be false—

MR. WARINGTON.—What I have said has been altogether misunderstood by Mr. Reddie. I said merely that there exists in the spirit of man that which claims to be heard in every man, I grant, but which cannot exercise its right to *control* unless it is assisted by the Spirit of God. I denied the existence of conscience in no man, nor the clear speaking of its voice. I believe there is no action in which conscience does not take some part; but, in order to clear the way for the first part of my argument, I said I would exclude the operation of conscience for a moment.

MR. REDDIE.—Mr. Warington's explanation—which I am glad to have heard—does not seem to require me to qualify any portion of what I have said. To return to the paper before us, there are one or two passages in it, in which I think the author is scarcely consistent. For instance, he says in one place, "To act without motive is impossible;" and in the preceding page he finds fault with Mr. Buckle for overlooking the fact that, though all motives are antecedents, all antecedents are not motives. But we sometimes act merely and purely from habit, without any motive at all. Reference has been made to the faith of the Gospel; and I may here be permitted to say, that the fact of the Gospel having made man a more completely free agent than he was before, is not the only great improvement in our moral condition it introduced. The Gospel also restored hope to man, as a motive, notwithstanding sin. St. Paul describes those who were without God, and who were ignorant of His character, as living "without hope." But Christianity is precisely adapted to our moral nature. We are not bound to judge ourselves merely in the way in which the Stoic or other heathen philosophers might judge themselves—we have opportunities for repentance. A man's conscience pricks him—he has committed an evil deed, and he sees its bad effects, and regrets it and repents. For the great feature of the Gospel is not that a man shall never sin at all, but that, having sinned, he may repent and sin no more. It is in that grand hope—the hope of retrieving our errors—that the Gospel has restored the moral tone of human nature. Buckle calls belief in free will "a dogma"; and Mr. Row seems to think that a nickname. But I do not know why it should not be called a dogma: it is an established principle that is taught, and I am very glad to know that it is. But there is a loose way of speaking of dogmas, which Mr. Row appears to have fallen into, as if there were something wrong in dogmas, merely as such.

With regard to Buckle's "science of statistics," there is really no such thing as a *science* of statistics, and such a title is a misnomer altogether. And with regard to his theory that "the laws which regulate the moral world are more uniform in their operation than those which govern the physical universe," we must not forget, with respect to any number of particular events occurring within a specified time, that nine-tenths of them have been caused by individual free will, or man's free action. Mr. Buckle, in his idea that suicides are not determined by the human will, seems to forget that three-fourths of them are occasioned probably by some wrong—"the oppressor's wrong, the proud man's contumely," that Shakespeare speaks of. So that even if you deny the operation of free will in the case of the suicide himself, you cannot deny it in the case of him who causes it. Then with regard to marriages, Mr. Buckle's assertion that marriages are ruled by the price of corn is the very best proof of their depending upon human volition. What "a living" is to a clergyman, the low price of corn, or cheap food, is to the masses; and it is most desirable that the masses should always act in the prudent way that these statistics would seem to prove they generally do. I thank Mr. Row very much for bringing forward this subject, because it really is by a right understanding of these great questions of human freedom that we can understand that God is not the author of evil, which the Positive philosophy would make Him,—only that it denies His existence altogether.

Rev. Dr. IRONS.—I must beg your indulgence for a moment, while I tell you a story connected with marriage statistics. An old gentleman of eighty married a girl of seventeen, and it led to most unhappy results, and eventually to a case in the law courts. The late Judge Cresswell, who told me the story, (before whom the case was heard,) said in summing up that it too often happened that marriages contracted between January and May were most unfortunate. A day or two afterwards he received a letter from the secretary to a certain Statistical Society, asking him to furnish the society with the statistics upon which the statement was founded that marriages solemnized between the months of January and May were always so unfortunate! (Laughter.) While the learned judge was puzzled what to reply, he afterwards got another letter from the same gentleman, telling him he need not answer his inquiry, as he (the secretary) "had been given to understand that his Lordship's statement would admit of another interpretation than that which he had placed upon it." (Laughter.)

The CHAIRMAN.—I do not altogether agree with all that has fallen from Mr. Warrington, although I go some way with him. I cannot but believe that man has a freedom of will which especially applies to moral actions, where there is any need of conscience to sit as a judge between right and wrong. So far as I can understand the argument used by Mr. Row in his paper, it is that man has as strong a proof of the freedom of his will as he has of his own existence—not of the existence of any other person, mind, but of his own existence. I want to know if I possess freedom of will. I say I do; and to put an end to it, is to deprive me of my moral faculties, and of all choice between good and evil. A Scotch anecdote which I have heard pertinently illustrates this question. A Presbyterian minister of strong Calvin-

istic views was always preaching upon predestination, and holding the view that every single action was predestined from all eternity. A maid-servant in his house broke a favourite dish of his, and she excused herself by saying, "Well, sir, it was ordained from the beginning that I should break that dish." (Laughter.) Whereupon the minister gave her a cuff on the ear, saying, "Yes, and it was also ordained that I should box your ears for your carelessness." (Laughter.) Then with regard to statistics. If men were actuated only by their motives and desires, marriage would be a constant quantity; but we find that is not so. Marriages are few when money is scarce and wages low, and they are increased when there is an increase in the means of supporting life, and a prospective family. I was once a curate in a populous district in the neighbourhood of Sheffield, and there were at the time but very few funerals in the parish, and the sexton said it was owing to the fact that trade was bad. I asked him how that could be, and he told me in reply that when trade was good there were plenty of funerals, but when trade was bad and the people were comparatively starving, there were very few, because the people had not the means for intemperance. But the statistics with regard to murder, which must also refer to other crimes as well, must be founded on mere coincidence. At one time two or three men imperilled their lives in shooting at the Queen. Now, if that had gone on a little while longer, Mr. Buckle might have got you up statistics to show that there was a certain law impelling a certain number of men in a given time to shoot at the Sovereign. But the Legislature stopped it by providing that men should not be hung for such an offence, but should be well flogged and imprisoned,—and that stopped it. Take another case. At one time the crime of wantonly destroying articles of great value in museums was very common, and a law was passed declaring that persons who offended in this respect should be well flogged. The crime was discontinued. The same thing has been observable in garrotting:—directly flogging was introduced, garrotting ceased. All this shows how absurd it is to generalize on statistics; and it also shows what a powerful influence the human will, as we understand it in common parlance, has in directing the actions of man.

Rev. C. A. Row.—In the discussion which has taken place my paper has not been seriously interfered with, and I shall say very little in reply. Mr. Warington fell into a misapprehension. I treated in my paper, not of the will *per se*, but of the rational will. I would also call Mr. Warington's attention to another thing. He quoted from the seventh chapter of the Epistle to the Romans, and he should bear in mind that in that same chapter St. Paul says, "Now then it is no more I that do it, but sin that dwelleth in me." In treating this question of the will, Mr. Warington took his own instance—the case of opening a book, which depended on the lowest motives of the human mind. I should rather have wished him to illustrate the matter by some of the higher motives of the mind. I cannot conceive how, according to his theory, any person can resist a temptation at all. (Hear, hear)

The Meeting was then adjourned.

ORDINARY MEETING, MAY 4TH, 1868.

THE REV. WALTER MITCHELL, M.A., VICE-PRESIDENT, IN THE
CHAIR.

The Minutes of the last Meeting having been read and confirmed, the Secretary announced the name of the following new member :—

Rev. George Roy Badenoch, Member of the General Council of Glasgow University, 1, Whitehall Gardens.

In the absence of the Author, the Hon. Secretary read the following Paper :—

ON THE NATURE OF HUMAN LANGUAGE; THE NECESSITIES OF SCIENTIFIC PHRASEOLOGY, AND THE APPLICATION OF THE PRINCIPLES OF BOTH TO THE INTERPRETATION OF HOLY SCRIPTURE. By the REV. JOSEPH BAYLEE, D.D., Principal of St. Aidan's College, Birkenhead; Assoc. Vict. Inst.

HUMAN language is the utterance of human thought. In a limited degree, the expression of feelings is indicated by sounds which have a natural connection with those feelings. These are chiefly interjections, and are remarkably similar in most languages—*e.g.*, *oh*, *ah*, and such-like. Some names of animals are derived from their natural cries. But the number of words derived from these sources is so small that they may be omitted from an outline discussion of the nature of language.

Had we the means of forming a judgment, a very interesting inquiry would be whether there is any natural relation between vocal utterances and intellectual ideas. In our present condition, we may safely affirm that there is not. If we were in an animated assembly, where impassioned speakers poured out torrents of debating eloquence in a language wholly unknown to us, we might be greatly interested at the sight, we might even be excited by their manifested emotions, but we should be wholly unable to catch any of their ideas. There is there-

fore, at present, no known natural connection between vocal sound and intelligent meaning.

The narrative in the second chapter of Genesis gives us invaluable suggestions respecting human language. Adam and Eve were created on the sixth day. Previous to the formation of Eve, the Lord placed Adam in Paradise, gave him instruction and admonition, and showed him all the newly-formed beasts of the field and fowls of the air. Adam gave them names when he saw them. If we may assume that there is no natural connection between sound and sense, God must have bestowed upon Adam a language sufficiently extensive for his then present needs, with the power of enlarging it as new objects were presented to his senses, and new thoughts came into his mind. It was in this way that Adam gave names to all the animals presented to him. The Hebrew language, as now known to us, is probably an adequate representative of the original language spoken by Adam. The names of himself and his descendants, of Eve, of Abel, and of Cain and his descendants, are all significant in Hebrew; they are not so even in the cognate languages. Now, as we may be certain that the first who gave the name of George was a Greek, so we may assume that those who gave those significant names spoke Hebrew. In examining the names of animals in Hebrew, we find that they do not describe their nature, but simply some one distinctive character. Some names are taken from their cries, others from similar causes. So it is with the names for man: Adam is man in the Divine image, from *dāmā*, to resemble; *ish* is man as lord of the inferior creation, from the formative *aleph*, and *yesh* (an existence), *i. e.* the principal being; *ēnōsh* is man in wretchedness, from the same formative *aleph*, and *noosh*, rendered "full of heaviness" in Ps. lxix. 20. From these suggestive hints in Scripture we learn that the fundamental elements of language were God's immediate gift to Adam, with the power of enlarging it as his wants or his circumstances demanded.

In confirmation of this view there are two phenomena of biblical Hebrew worthy of attentive consideration; one is the significance of some remarkable words, the other the modifications of meaning in the usage of some words. In illustration of the former, let us take the words Earth, Deep, Firmament, Lights; and of the latter, Living Soul, Life, Priest.

EARTH.—*ṣṣā* (*ṣrēṣ*) is from *ṣṣ* (*roots*), to run, with the formative * (*aleph*).

DEEP.—*ṭhā* (*thā-hōm*) is from *ṭṭ* (*hoom*), to agitate, to break up. It is the crust of the earth, and is distinguished from the sea in Job xxviii. 14, although it is metaphorically used for the sea in various places.

FIRMAMENT.—רָקִיעַ (*rā-kē-ang*) is a beaten-out thing, and so, an expanse. Contraction and expansion, solidification and fluidity, are idealized in this word, and exemplified in its usage.

LIGHTS.—מְאֹרֹת (*mē-ō-rōth*) is not to be confounded with the simple word אֹרֶךְ (*ōhr*) light. "Lights" is rightly expressed in the Vulgate by *Luminaria* and in the Septuagint by *φωσφόροι*, lamps.

As the receptacle of light the word is feminine, as the dispenser of light it is masculine.

LIVING SOUL—נֶפֶשׁ חַיָּה (*nephesh chāy-yāh*) is a bodily frame with life in it. Its historical usage exemplifies the modifications of the application of a word in the progress of a spoken language. In the Pentateuch the word *nephesh* is all but exclusively applied to the body; in the Psalms it is invariably applied to the soul.

LIFE.—חַיָּה (*chāle*) seems etymologically to mean activity, and therefore motion. Hence the word was applied to running water.

In its feminine form the word was joined with נֶפֶשׁ (*nephesh*), a bodily frame, to express a living animal; but when we come to the times of Ezekiel, it is used without *nephesh* to express the living animals which Ezekiel saw in vision. Hence St. John describes the same symbolical creatures as ζῶα, living creatures, or beasts, in the old English meaning of the word.

A very instructive use is made of the word life as applied to animals or to men. In the latter case it is almost invariably plural, in the former always singular. This implies two lives in a man, and but one in an animal. Body, soul, and spirit is the threefold complexity of man.

PRIEST.—כֹּהֵן (*co-hain*) is another illustration of the historical modifications of language. In its earlier usage it applied to a public functionary, whether secular or sacred. In later times it was limited to the priesthood.

Whether we assume language to be a divine gift or a human invention, it is remarkable that the most ancient language in the world should have words indicative of a more profound knowledge of natural phenomena than science could have discovered at so early a period. How could any one account for the most ancient language in the world giving such a name to the earth as the runner, except by Divine gift? This is the more striking when we remember that the name, without its significance, has found its way into other languages. *Eretz* is plainly the original of *Erde*, earth.

From these suggestive hints of the origin of language let us pass on to the consideration of the marvellous variety of languages. Here again a suggestion is given in one Scriptural phrase worthy of our most profound study: "Go to, let us go down and there confound their language, that they may not understand one another's speech." The various languages are a

confusion, not a creation. Let us observe the attempts of children to imitate articulate sounds, and we shall find them involuntarily substituting one letter for another. This is caused by the imperfect development of the organs of speech. A comparatively slight modification of the organs of adults would produce similar results. This would be sufficient to produce the primary result at the tower of Babel. Climate, association, and various habits and circumstances, would produce the rest. These thoughts would furnish an additional clue to the modern philological inquiries which have already yielded such excellent fruit.

It is well for the interests of biblical science that the investigations of modern philologists have been carried on independently of any conjectural theory of language. Those investigations were too long confined to the cultivated forms of language, as seen in written works. Philologists have at length discovered that there is a mine of hidden wealth in the once neglected speech of uncultivated tribes. This has produced almost a literary revolution.

By an extensive comparison of languages, that great instrument of human thought is far better understood, and its principles more truly appreciated. The various contrivances to express the shades of thought have been more distinctly seen, and language, as an instrument of thought, has been brought more clearly under the investigation of true philosophy.

The words by which ideas are expressed can never be clearer than the ideas themselves. Where the latter are undefined, the words must have a corresponding indefiniteness. The Bible, as God speaking to man in human language, must be dealt with on the principles of human language. It is God's infallible revelation conveyed to us through a fallible instrumentality. The contrivances resorted to by Divine wisdom to secure the infallibility of His word are truly wonderful, and yet they are all within the sphere of human agency. In the first place, the language of the Bible is to be examined as we examine that of any other book. If we are interpreting an author, we consider the times under which he wrote, his own circumstances and character, the state of the language in his time, the subjects on which he was writing, and similar matters. A poet, a historian, a metaphysician, or a lawyer, would not use certain words in the same exact meaning. The metaphors of poetry would be out of place in the discussions of metaphysics. The *αἰὼν* of Homer is not the *αἰὼν* of Alexandrine philosophy, nor again of the Rabbinical phraseology. In our own day the democrats of America are not to be classed with the democrats of England. In France, a Unitarian is one

who wishes France to be a unity; in England, he is a denier of the Divinity of Christ. The Latin *sacramentum* has gone through three distinct meanings, preserving one fundamental idea. Sacredness runs through the three. With Cicero, *sacramentum* would include, if not express, the military oath. In the Vulgate it is the representative of the Hebrew פֶּלֶא (*pēlā*), a wonder, and of the Greek μυστήριον, a mystery. It is applied to Nebuchadnezzar's dream, and to the woman who was sitting upon the beast. Since the scholastic writings, the word has included spiritual grace.

From the Rabbinical writers the Greek αἶὼν has acquired the meaning of the material world, as we see in Heb. i. and xi.

On these principles we may lay down the general rule that the language of the Bible is to be interpreted on the principles of human language.

In order to preserve the infallibility of Divine revelation in the use of so fallible an instrumentality as human language, God has given the revelation of His mind and will in various ways. History and biography exhibit, if I may use the expression, principles incarnated. Ritual and Symbol are other forms of declaring the same truths. Ordinary didactic language combines with them to make doctrinal teaching infallibly clear. Another provision has been the gift of Divine revelation in two languages, by which many ambiguities are removed. It would be a work of surpassing interest to pursue this part of the subject at great length, but it does not directly come within our present purpose. I pass on, therefore, to the necessary principles of scientific language.

As I have already said, human language can never be clearer than human thought. Where ideas are unavoidably obscure, language must be proportionably so. A striking example is in the word *person*. Who can tell what is the bond of connection between body, soul, and spirit, which we describe as personality? We are conscious of being a unity, yet how great a complexity. Person, in Greek ὑπόστασις, expresses a mode of being, without defining the mode. As God and man are united in Christ in one consciousness, we speak of Jesus Christ being one Person in two natures. In the Godhead, on the other hand, there is a threefold consciousness in one Being,—Father, Son, and Spirit, that we designate three Persons in one God. Further than that it is, at present at least, impossible for us to go. How convenient and how adapted to the need of indistinct conceptions is an indefinite word which describes a mode of existence without exactly declaring the mode.

In scientific matters we act on the same principle; indeed

we could not do otherwise. We know nothing as it really is: we know it by its qualities and appearances; but the true reality is beyond our reach. If we endeavour to declare what gold is and what is silver, we can only describe one quality after another. We state in what things they agree, and wherein they differ; but at the end we have only been describing qualities or phenomena, not realities. Colour, specific gravity, ductility, and so forth, only describe properties. The same principles apply with equal, if not greater force, to what we generally call natural phenomena. If some new appearance were now to be visible in the heavens, we should at once describe it by some distinctive phenomenon. Gradually scientific men would discover additional phenomena. The original name would imperfectly describe the new knowledge, but it would be found more convenient to retain it. Who would think of altering the terms comet, planet, fixed star? Yet who believes that the comet is a hairy star, the planet a wanderer, or the fixed star immovable? What confusion has been introduced into science by needless changes of terms. In consequence, older books become limited to the learned, through mere nominal change. This is especially the case in geology: Eocene, Miocene, Pleistocene will probably soon become obsolete terms, and granite give up its claim to be always a primary rock. To attempt to describe things instead of phenomena in natural science would introduce endless confusion. On the other hand, where the phenomenon continues the same, the retention of the same term is of ready adaptation to general use. The thing becomes the subject of scientific study, the name is only intended to describe the phenomenon. Would it be possible to invent two terms equally convenient with sunrise and sunset? Yet who believes that the sun really rises and sets? Let us then lay down the general principle that the language of science is that of phenomena, and apply the principle to the interpretation of Scripture. In doing so all confusion would vanish. The famous objection to the sun and moon standing still would become changed into admiration of the Divine wisdom and goodness. The objector asks, with an air of triumph, are we really to believe that God stopped the course of the solar system for the convenience of the Israelites when fighting a battle? How many minds have been disturbed by the apparent difficulty. But let us examine the language of the narrative: "So the sun stood still in the midst of heaven, and hasted not to go down about a whole day." (Josh. x. 13.) Let us ask the objector what does he mean in ordinary language by the sun going down? Does he describe a phenomenon or a reality? There can be but

one answer. Why then does he not apply the same principle here? If sun-down means the apparent descent of the sun below the horizon, sun-still describes an analogous phenomenon. The one describes the reality no more than the other. Instead, therefore, of inquiring whether the whole solar system suddenly stopped, we are only required to believe that by some means unknown to us it pleased God to cause the sun to retain his apparent place in the heavens for twenty-four hours. We have no more need to inquire into the manner how than in the case of any other miracle. How were the loaves and fishes multiplied? how did Jonah breathe when in the whale's belly? how will the dead in one moment assume resurrection bodies? One answer covers all—by the power of God.

Let us examine this miracle of the sun and moon in another aspect, and we shall see in it abundant evidence of Divine wisdom and goodness. The nations of the world were rapidly casting off the worship of the one true God, and the inhabitants of Syria especially had given themselves up to nature-worship. The sun and moon were their principal deities. In His wisdom and righteous judgment, God was allowing the nations of men to walk in their own ways and to choose their own delusions, yet He left not Himself without witness. He placed one people in the centre of the inhabited world, and committed to them a written revelation and an instituted worship. These were to be God's witnesses to all nations, and in order to be so, must themselves be preserved from all idolatry. By manifesting His power in that remarkable manner over the sun and moon, He gave public evidence, not only to Israel but to all nations, that He was supreme over all nature. Who can tell the amount of preservation to Israel, and of instructive admonition to all nations, from the Pillars of Hercules to the remote East, which resulted from that one transaction? As far as eternal interests exceed temporal ones, so far did the wisdom and love which granted that wonderful phenomenon exceed the agency by which it was produced. Down to the death of the elders, who over-lived Joshua, Israel continued steadfast in the worship of the one and only God.

Interpret the words of Joshua as the language of phenomena, and science has no objection to allege against the history.

Let us now come to the much-cavilled-at chapter which gives us an account of the origin of all things and of the six days' work. There is no doubt that on a superficial reading of the first chapter of Genesis there is an apparent contradiction to what science teaches us respecting the true condition of this earth. Many contrivances have been made to harmonize the discoveries of geology with the supposed meaning of Moses's

words. They have deservedly failed, for they are founded on false assumptions. The Bible needs no such contrivances. It only requires to be dealt with as we do with the interpretation of human writings. In the first chapter of Genesis all is historic narrative, and all should be interpreted as scientific history. In doing so we have only to keep close to the *usus loquendi* of the Hebrew language, and everything is not only accordant with our true knowledge of natural phenomena, but the whole is full of most admirable suggestion. The narrative opens with the truly majestic statement: "In the beginning God created the heaven and the earth." Those who have studied the speculations of Greek and other philosophers respecting the origin of all things, and have been wearied with their interminable confusions, can best appreciate the glory of the Mosaic statement.

Let us take it word by word, keeping strictly to the exactness of Hebrew usage.

"In the beginning." Fanciful interpreters have endeavoured to draw mystical and cabalistic meanings from so simple a phrase as "in the beginning." A Chaldee targum borrows an idea from the 8th of Proverbs, and interprets them of Divine wisdom—בְּחִכְמָתוֹ (bē-chok-māh)—By wisdom God created the heaven and the earth. The opening of St. John's gospel has been supposed to give a meaning of remote eternity to the words, "In the beginning was the Word." Whereas, St. John simply declares that "Before anything had a beginning the Divine Word was,"—i. e. pre-existed. The Jewish Cabala anagrams the letters בראשית into יאשרי in the 1st of Tisri, making thus the origin of the world about our September; so that Adam might have ripened fruits ready for him. Such interpretations are unworthy of serious refutation. If we look to the usage of the Hebrew language, there is no mystery in the words: they simply mean at first, and so declare that all things had a beginning by the creative power of God: "Through faith we understand that the worlds were framed by the word of God, so that things which are seen were not made of things which do appear." (Heb. xi. 3.) "He spake, and it was done: He commanded, and it stood fast." (Ps. xxxiii. 9.)

"God created the heaven and the earth." Here again inattention to the *usus loquendi* has caused the loss of much invaluable truth. To create has been interpreted to mean giving mere existence out of nothing, as if Moses taught that at first God gave existence to the materials of heaven and earth, and then framed them in an admirable order. The Greek Chaos was a subsequent corruption, and not an original

doctrine : there is not a trace of it in Scripture. The contrary doctrine is taught here. Create is a term used three times in the Mosaic cosmogony, as given in the first chapter of Genesis :—1. For the origin of all things. 2. For the great whales and the moving things of the waters. 3. For man. If we examine the *usus loquendi* of the word, we arrive at the following conclusions :—

1. In the simple form of the word it is never applied to the work of man or of any creature.
2. Never to God's work in process.
3. Only to God's work in a complete state.

Hence to create heaven and earth is a Divine work giving perfect existence to heaven and earth. Whether God's work was instantaneous or progressive, the word *create* was applied to it only when complete, and not before. Thus it is said "Male and female created He them." That work was progressive. God took dust and formed it into a human body : He then breathed into that body the breath of life. A man was thus formed : after that a woman was made out of the man. The man was said to be formed, the woman to be builded : but when completed, and only then, it is said "Male and female created He them."

The land animals are not said to have been created, and yet the aquatic ones are. The reason appears to me to be that the aquatic animals are perfect in their kind, but the land animals are not : man is their perfection and head.

Another usage of the word is in the Pail or intensive form, in which it is employed for destruction. The corresponding Sanscrit word has the same application, on the ground that only he who has the power to create has power to destroy : "He can create, and he destroy." In this, or an analogous sense, the word is three times found in Scripture. In the Hiphil, or causative sense and form, the word is once used, and only once. It is rightly rendered to make fat, 1 Sam. xx. 29 ; and so, as an adjective, we have בָּרָא (bēre) fatness. Now if בָּרָא (bārā), to create, is never elsewhere used for any creature work, nor for giving existence in a chaotic state, nor for any work in process, but only for God's work when completed, surely the *usus loquendi* requires us to believe that it is similarly used here. We thus, on the strictest principles of philological investigation, arrive at the conclusion that the Mosaic statement is :

1. That all things had a beginning.
2. That their existence was the work of God.
3. That they received not a chaotic but a completed existence from Him.

Our resurrection is to be in a moment, in the twinkling of an eye. That glorious creation was similar. "He spake, and it was done."

Having given us this magnificent account of the creation of all things, Moses proceeds to detail facts concerning this earth. His first statement is, "And the earth was without form, and void." It is nowhere said that heaven was without form, and void. The statement is limited to this earth. Upon the meaning of the phrase "without form, and void," the whole question of the Mosaic cosmogony turns. Happily Scripture leaves us in no reasonable doubt. The phrase occurs but three times in Scripture, and in two of these it undoubtedly means ruined. The first is Isa. xxxiv. 11, where the words are rendered confusion and emptiness:—"The Lord shall stretch out upon it (Idumæa) the line of confusion, and the stones of emptiness."

The second is in Jeremiah's lamentation over the ruin of his country:—"I beheld the earth, and lo it was without form, and void" (iv. 23).

Although the whole phrase occurs but three times, the principal word *thohu* (*thohu*), occurs twenty times, and with the same results. Instead of translating the word, I shall retain the Hebrew one in two remarkable quotations: Isaiah describes the ruined city of Jerusalem as "the city of *thohu*" (xxiv. 10).

He declares respecting God's creation of this earth, "He did not create it *thohu*" (xiv. 18). It is true that these words are rendered in most versions as if there were an ellipsis, *לֹא הָיָה לְתוֹהוּ* (*le thohu*), in vain; but this is a conjectural addition. The original words are *לֹא הָיָה בְרֵאֵה* (*lō thōhu berāāh*), He did not create it (the earth) *thohu*.

Let us insert this declaration of Isaiah into the Mosaic statement.

In the beginning God created the heaven and the earth.

And He did not create the earth *thohu*, and the earth was *thohu*.

Is it not evident that the *thohu* condition of the earth was a ruined one, and not its original state?

In the Zohar, as quoted by Ludovicus Capellus, there is a comment remarkably confirmatory of these views:—

EXCERPTA ex Zohar, fol. 24, 6, ad locum Genes. ii. vers. 4, 5, 6.

1. Hæ sunt generationes cœli et terræ, &c.

SELECTIONS from the Zohar, fol. 24, 6, on Gen. ii. 4-6.

1. These are the generations of heaven and earth, &c.

Ubi cumque scribitur *אֵלֶּה* (nempe cum *אֵלֶּה* profanantur priora, (seu præcedentia). Et hæc sunt generationes *וְנִינִן* quæ significantur vers. 2. Terra erat *אֶרֶץ בֹּהוּ*. Illa sunt de quibus dictum est quod Deus benedictus creavit mundos et destruxit eos, et propterea terra erat *thohu va-bohu*, desolata et vacua.

Wherever there is written *אֵלֶּה* (*ail-le*) [these]—e.g. with *וְנִינִן* [*thôlédôth*] the former words are put aside.

And these are the generations of *thohu* which are signified in ver. 2. The earth was *thohu* and *bohu*. These are the words of which it is said that the blessed God created the worlds and destroyed them, and on that account the earth was *thohu* and *bohu*, desolated and empty.

The learned critic follows up this extract with an interesting statement of the cabalistic, or rather mystical, interpretations by the Rabbins. These do not belong to our present purpose, which is simply to show that Jews—at or near the time of our Lord—held that the *thohu* and *bohu* condition of the earth was not its primary, but its ruined state. Were it needful, I could produce many similar Rabbinical interpretations of *thohu* and *bohu*, proving that the words mean ruined.

Let us now examine more in detail the important passage in Isa. xlv. 18. Even without departing from the received versions, one result is undeniable—that *thohu* means ruin.

“For thus saith Jehovah that created the heavens: God Himself that formed the earth and made it: He hath established it; He created it not in vain. He formed it to be inhabited. I am Jehovah, and there is none else.”

We have here a distinctive use of created, made, formed, established, which is full of instruction.

He created the heavens, for there is nothing said anywhere of a process in their construction.

He formed the earth, because a progressive formation is detailed.

He made it—i.e. He put it together, as a workman does with materials ready to his hand.

He established it—i.e. He gave it such an existence as cannot be annihilated.

He did not create it in vain (or for *thohu*).

This rendering supposes an ellipsis of a preposition, and in that sense the words would mean: He did not create it that it might go to ruin; which shows that *thohu* means ruin; and also that it does not describe the state of the earth at its creation. These observations result in the same conclusion as the more literal rendering of the passage: “He did not create the earth *thohu*.” This latter is the rendering of Bishop Walton:—

“Non inanitatē creavit eam;” and also of Vitringa:—
“Non creavit eam rem inanem.”

Having thus, I trust, fixed the meaning of *thohu* and *bohu* as ruined, the next statement is, "And darkness was upon the face of the deep."

Remembering that *thohu* and *bohu* mean a changed condition, the consequent darkness would be a change from a former state of light. If Jeremiah describes the ruined state of his country by saying, "I saw the heavens, and they had no light," Isaiah predicts of the future, "Arise, shine, for thy light is come, and the glory of the Lord is risen upon thee."

After this darkness upon the face of the deep, God said, "Let there be light, and there was light."

In this earlier description we read of the face of the deep—i.e. of the broken-up crust of the earth—furthermore: "The Spirit of God moved upon the face of the waters." Here it is intimated that the deep was covered with waters. Consequently, the whole surface of the earth was then covered with waters. Afterwards God said, "Let the waters be gathered into one place, and let the dry land appear." In the 104th psalm we learn that this was effected by the agency of volcanic action:—"At Thy rebuke they fled; at the voice of Thy thunder they hasted away. The mountains ascend—the valleys descend into the place which Thou hast provided for them."

In all volcanic countries the underground volcanic noises are called thunder. Now, according to this Mosaic statement, the upper strata of mountains must be aqueous; and so they are: but if aqueous, those strata must have been formed when the mountains were level, and so the ocean waters would cover them. This is exactly accordant with true science. But there is another remarkable statement. We have to resort to geology to account for the structure of the crust of the earth; but geology can tell us nothing of the production of life. Moses does: "The Spirit of God moved upon the face of the waters." For what? Let the 104th psalm tell:—"Thou takest away their breath; they die, and return to their dust. Thou sendest forth thy Spirit; they are created, and Thou renewest the face of the earth." (Ps. civ. 29, 30.) "Moved" is a word which occurs three times: here, and for an eagle fluttering over her young (Deut. xxxii. 11); and for the shaking bones of a drunken man (Jer. xxiii. 9).

That brooding movement of the blessed Spirit was instilling life into the yet unborn animal creation which was in embryo in the earth. It was a Divine operation in the darkness. We might subject the remainder of the chapter to the same

scrutiny with the same results. Everything is in accordance with true science. I may summarize them thus :—

1. In the beginning God gave a perfect existence to the earth.
2. By some cause here unexplained the earth became ruined.
3. The character of that ruin was a crust broken up, the mountains levelled, the waters covering the whole surface of the earth, the previous light turned into gross darkness.
4. The Holy Ghost brooding over the whole, instilling a renewed life.
5. Through six successive stages God restored the earth.

These five principles are in exact accordance with observations and natural science. They are the only true account of geological phenomena which the world has yet seen.

They involve also another subject of inquiry and thought, which the non-theistic philosophers of the day would do well to ponder.

Why all that ruin to which all geology bears witness ?

The Bible furnishes a clue, if not an answer :—

If there was sin before Adam, there was ruin before Adam. May not the one have been connected with the other ; and so this earth have been the battle-field between sin and holiness, —the theatre of probation—a spectacle to angelic worlds ?

The limits of this essay do not permit me to apply the same principles to the narrative of the Noachic flood, with all its interesting questions of the redistribution of animals, and of the families of men. That Mosaic narrative throws a flood of light upon these questions. Without it we could not tell—

1. Why there are no historic nations south of the Torrid Zone.
2. Why there are no land animals south of the same zone which could not have crossed that zone.
3. Why, with regard to language, philologists have been compelled to divide mankind into three great divisions.

I pass on, however, to another aspect of the scientific interpretation of Scripture: its suggestive character in the scattered notices of natural phenomena. It is often said that the Bible was not written to teach science, and therefore we need not look for infallibility in its scientific allusions. This principle would degrade the sacred volume to a human level. If the book be divine, all its statements must be true. The word of God, like the works of God, does not present truth in a scientific method but in separate phenomena, leaving to men the task of arrangement and systematizing. As in the one, so in the other, we approximate to a perfect system from age to

age. Each separate statement or phenomenon is true: the human arrangement is necessarily imperfect in some of its parts. Each additional discovery modifies the previous human arrangement. Astronomy, geology, and chemistry are continually furnishing us with examples. So our Lord says of the Bible: "Every scribe which is instructed unto the kingdom of heaven, is like unto a man that is an householder, which bringeth out of his treasure things new and old." The new things had always been in his exhaustless treasury; they are gradually brought out. The positive statements of the earlier knowledge are not contradicted by new discoveries. They are seen in new lights, and are filled with new lessons. In this aspect of the Bible, it is most blessed for the mass of mankind that the believer may be perfect in his faith, although unskilled in dogmatic theology. He who comes to the Holy Communion with a loving, trusting heart may be utterly unskilled in the doctrine of the Real Presence and yet realize in his happy experience Incarnate Deity in the depths of his spiritual-consciousness.

Laying aside all thoughts of deriving a system of natural philosophy from the Bible, it is most interesting and instructive to examine its innumerable suggestive hints. I shall select a few examples.

Ps. lxxviii. 15, 16.—"He clave the rocks in the wilderness, and gave them drink as out of the great depths. He brought streams also out of the rock, and caused waters to run down like rivers."

In a poetic passage such as this one would hardly expect the strictness of scientific phraseology, and yet it is here, with marvellous correctness.

We have two words for rock:—

צָרִים (*tzūrēm*), the generic word for rocks as lying in strata.

קֶלַע (*selang*), a projecting rock.

The great source of the waters was from the underground strata, which contain such abundant reservoirs of water, described here as the great depths, תְּהוֹמוֹת רֶקֶה (*thē-hō-mōth rabbāh*), a noun plural, feminine, with an adjective singular; the feminine plural indicating their multitudinousness, the adjective singular their collectiveness. The strata were cloven that these waters might rise up. This is the principle of the modern Artesian well. The other word (*selang*) is a projecting rock such as Moses could strike. From that rock flowed the smaller streams, from which they drank immediately, and the larger river which followed them: "They drank of that Spiritual Rock that followed them: and that Rock was Christ." (1 Cor. x. 4.)

The same accuracy is in Ps. cvi. : 41—"He opened the rock (רֶקֶט, *tsōōr*, the stratum of rock), and the waters gushed out: they ran in the dry places (בְּתֵיבֵי הַיָּבֵשׁ, *batstzeeyōth*,—in arid places,—not merely a wilderness, where pasturage might be, and therefore moisture)—a river." Again, let us look at a single metaphor in Job xxxvii. 16 :—

"Dost thou know the balancings of the clouds? the wondrous works of Him which is perfect in knowledge?"

The mysterious Elihu, like the ancient observers of the phenomena of nature, saw a greater evidence of Divine contrivance and wisdom in a single cloud than men who looked upon them collecting and dissipating, but did not reflect upon one of their greatest marvels—why are they like the dishes of a balance, rising and falling? Elihu does not tell how or why the clouds so rise and fall, but he felt that they had something to do with weight, and he describes it as a wondrous work of God, to be sought out by man. How many ages intervened before Galileo discovered the cause.

Three remarkable passages in the 40th chapter of Isaiah illustrate the scientific accuracy of even the poetic language of Scripture :—

"Who hath measured the waters in the hollow of His hand, and meted out heaven with the span, and comprehended the dust of the earth in a tierce, and weighed the mountains in scales and the hills in a balance." (v. 12.)

"It is He that sitteth upon the circle of the earth." (v. 22.)

"Lift up your eyes on high, and behold who hath created these things, that bringeth out their host by number: He calleth them all by their names, by the greatness of His might, for that He is strong in power: not one faileth." (v. 26.)

How remarkably all these words agree with the fullest discoveries of science. If this did not anticipate them, the science of the Hebrews far exceeded anything that we know of that of ancient nations.

The waters of the ocean are measured—מִדָּד (mā-dād) the proper word for exact measurement. Let us compare this statement with the law of evaporation, as given in Eccl. i. 7, and with the unity of all the seas in one ocean in Gen. i. 9; and we can form a just estimate of the scientific teaching of inspiration.

"All the rivers run into the sea; yet the sea is not full: unto the place from whence the rivers came, thither they return again."

"Let the waters under the heaven be gathered unto one place, and let the dry land appear...The gathering together of the waters called He seas."

It was God who declared that the waters of the whole earth made one great ocean, and that it was subdivided into seas. Isaiah was inspired to declare the exact adjustment of the proportion of land and water.

Heaven is meted out with a span.

The words here used express the utmost accuracy. A span, זַרֶּת (*zereth*) is exactly the same as our own span, the space marked out by the extended finger and thumb.

Meted is תִּקֵּן (*tik-kain*) applied to exact weight or measurement, whether morally or materially:—

"The Lord weigheth the spirits." (Prov. xvi. 2.)

"By Him actions are weighed." (1 Sam. ii. 3.)

"Is not my way equal?" (Ezek. xviii. 25.)

"He weigheth the waters by measure." (Job xxviii. 25.)

"They gave the money, being told." (2 Kings xii. 11.)

What a glorious idea Isaiah gave of the omnipotence and the skill of God! The, to us, immeasurable spaces of the heavens are measured by God's span, and accurately arranged. The stars of heaven have their assigned places. Job knew that a similar adjustment is in the wind and water of the earth. "To make the weight for the winds: and He weigheth the waters by measure."

He comprehended (כָּל *kāl*, completed) the dust of the earth in a tierce (שְׁלִישׁ *shūlish*, third part)—i. e., the arable part of the land is one of three great divisions:—

1. The mountains. 2. The arid land. 3. The arable land.

He weighed the mountains in scales and the hills in a balance.

He made an exact adjustment of the relative gravity of the mountains and hills to the whole crust of the earth.

There is here a suggestion which far exceeds our present scientific knowledge. It will yet be found to contain a wonderful amount of scientific truth.

"The circle of the earth" is an expression which shows that the Hebrews did not believe the earth to be a four-cornered flat thing, but a globe.

The last statement is about the stars of heaven.

God created them, i. e. gave them a perfect existence.

They are a host—צָבָא (*tzābā*) an orderly arranged multitude.

They are numbered, as if written down in a book in exact computation.

They are continually brought forth—מוֹצֵא (*mōtzēē*, caused to go).

They are called by names.

God knows and cares for every one of them.

A scientific system is not given methodically here ; but how marvellously all the statements agree with our profoundest knowledge of science, and even give important suggestions beyond our present knowledge.

The book of Job and the Psalms are full of similar statements. Indeed, the old Testament Scriptures throughout would well repay scientific investigation. I must, however, remember my limits.

Those who cavil at the scientific and natural statements of Scripture, have shown the most discreditable inaccuracy. Two examples are furnished from the ostrich and the hare.

In Job xxxix. 14—16, God says of the ostrich, "Which leaveth her eggs in the earth, and warmeth them in dust, and forgetteth that the foot may crush them, or that the wild beast may break them. She is hardened against her young (בָּנֶיהָ *bā-nēēm*, offspring), as though they were not hers: her labour is in vain without fear."

The only statement here is about the want of care of her eggs, which is perfectly true. The cavillers bring examples of her care of her fledged young ones, of which the passage says nothing. Birds in general are remarkable for building nests for their eggs, and for carefully sitting upon them to give them warmth. They select such places as will shelter them from injury. The ostrich does nothing of that sort, but deals with her eggs exactly as is here described.

The second case is that of the hare chewing the cud.

Our English expression of chewing the cud implies that the food is cut a second time. The Hebrew is simply to bring up a cut thing, without any reference to chewing, and this the hare does. The inquiries, therefore, about the formation of the teeth of the hare were simply out of place.

Even amongst careful commentators the want of accuracy upon those subjects has caused much misapprehension and difficulty ; *e.g.*, the curse upon the serpent in the narrative of the fall.

Scripture distinguishes serpents into two great classes : those who spring at their prey, and those who crawl upon the ground. The former are called flying serpents, the latter serpents of the dust.

Many commentators have conjectured that the serpent of which Moses speaks had originally legs or wings, and that he was deprived of these and caused to go upon his belly. Moses says nothing whatever about legs or wings ; so that all the difficulty is one caused by mere conjecture. The serpent there spoken of had once been able to spring at his prey like the

flying serpents. He was deprived of the elasticity of the flying serpent, and degraded to the class of serpents of the dust. By this judgment his food became soiled with dust instead of the pure condition in which the springing serpents have theirs. There is thus nothing whatever unnatural in the Mosaic narrative.

Another example of the inaccuracy of commentators is in the statement about the window in Gen. vi. 16. "A window shalt thou make in the ark, and in a cubit shalt thou finish it above."

It is very remarkable how long an error remains uncorrected. The Vulgate stands alone amongst all the ancient versions in rendering the word חַלּוֹן (*tzohar*), a window.

The LXX. renders the word as an active participle—ἰπισυνάγων—jointing; but the grammar of the passage requires a noun, and not a verb.

The Chaldee Targum, the Syriac, Samaritan, and Arabic versions, use words which signify shining, but none of them give the same word that is used for the window which Noah opened to let out the raven and the dove.

The word occurs twenty-five times, and is everywhere else rendered noon, noon-day, or their equivalents.

Yet with all this weight of testimony, the modern versions follow the incorrect rendering of the Vulgate. Even so eminent a critic as Gesenius has fallen into two or three errors in his short article upon this word. He gives:—

חַלּוֹן lumen. Gen. vi. 16. חַלּוֹן חַלּוֹן חַלּוֹן lumen facias arcæ, h. e. fenestras, Gr. φῶτες (cf. viii. 6). More collectivorum cum fem. constr., unde חַלּוֹן חַלּוֹן חַלּוֹן usque ad ulnæ longitudinem facias eas (fenestras).

Here Gesenius acknowledges the word to mean light. The noun is singular and masculine, and yet he grammatically deals with it as if it were feminine plural. He was compelled to do so by his false view of the meaning of "in a cubit shalt thou finish it above," because the pronoun is feminine. Had he taken the feminine noun ark as the antecedent, all would have been clear. "In a cubit shalt thou finish the ark above;" i.e. thou shalt give a rise of one cubit to the central line of the roof, so as to cause the water to run off.

Gesenius falls into another mistake in referring to Gen. viii. 6 as proving that the word *tzohar* means a window, for in that place *tzohar* is not used, but *challon*, the ordinary word for window. The Greek word there is not φῶτες but Συγίς. He also errs in giving φῶτες, which means men, instead of φῶτα.

It is thus that an error once introduced, often continues for

centuries. In the interpretation of Scripture, many errors would be avoided, and much difficulty removed, if commentators were more careful in examining Scripture's own use of its own phrases. We have another example from the New Testament. Mediæval Europe was so restricted to the use of the Vulgate, that its phrases tinged the theology of the Western Church to a greater degree than is commonly supposed. Protestant and Romish writers have almost unanimously accepted the meaning of "the gates of hell" to be the power of the devil and his agents. It is utterly impossible to assign such a meaning to the phrase, on any true exegesis: "Hell," ᾗδης, was never the abode of Satan. It is limited in Scripture to departed spirits. The gates of Hades must therefore mean the entrance into that place. Accordingly, Hezekiah speaks of the then probably fatal results of his sickness, as, "I shall go to the gates of Hades" (or *Shēöl*). How strangely his fellow-countrymen would have felt could they have heard a mediæval theologian asserting that Hezekiah meant that his boil would send him to the devil!

It is time, however, to draw to a conclusion. I trust I have pointed out the true method of the interpretation of the language of Scripture in general, and inclusively of its scientific language. I trust also I have shown that the Bible can bear the strictest scrutiny, provided its scrutinizers be themselves qualified for the task. It is indeed God's infallible word. Its statements and teaching connect themselves with every department of human knowledge, and every possible subject of human thought. In morals, in legislation, in philosophy, in science, in general literature, and human history, it is like the sun in the solar system, casting bright beams of light upon them all. It tells man whence he has come, whose he is, how he is to live in this life, and what is the hope of blessedness in the life to come. God in Christ and Christ in God are gloriously manifested in its holy pages; and man in Christ and Christ in man are seen in all the truth of resurrection humanity, filled with all the fulness of God. May we all more reverentially study its whole teaching, and under the guidance of the ever Blessed Spirit be kept in its holy paths onwards and upwards to the heavenly blessedness.

On the motion of the CHAIRMAN, a vote of thanks was passed to the author of the paper.

Rev. Dr. THORNTON.—I feel rather at a disadvantage in having to criticise a paper with the main object of which I so much agree. It is not necessary for me to subject the statements it contains to a minute criticism, and to point out where I differ from them; but there is considerable doubt in my

mind as to the correctness of some of Dr. Baylee's derivations. For instance, he gives the derivation of the word earth, *eretz*, from *rootz*. Now, I, on the other hand, am inclined to think that *ara* is the important root of the word; and if you compare it with the Aramaic, and also with the Greek word *ἄρα*, I think that impression will be confirmed. Again, in obtaining the derivation of *thohm*, or deep, I should commence with the word *thohu*, which is afterwards so much discussed by Dr. Baylee. But it is hardly necessary to follow out this minute criticism. I think Dr. Baylee wants to point out that the language of Scripture is very peculiar, and that to get at a right understanding of it we must divest ourselves of all preconceived notions, and consider what the words of Scripture in their first literal and grammatical meaning do imply. We must go to the original words themselves, and when we have ascertained their etymological meaning, as well as their meaning according to the context, then, and not till then, can we approximate to what the Scriptures wish to reveal. That I take to be the view with which Dr. Baylee starts; and it is in consequence of neglecting that rule that a great many scientific men have been led to make attacks on the Scriptures, which have proved to be fatal to themselves; because they have been attacking, not what the Scriptures really say, but what they have supposed the Scriptures to say. I brought this subject before you on a former occasion, in a paper "On the Logic of Scepticism;" but I think Dr. Baylee may not have read our *Journal of Transactions*, or studied some of our previous papers and discussions. The question on that occasion was discussed, and a valuable interpretation of one disputed passage was supplied by Mr. Warington. In this paper I think Dr. Baylee assumes that we are unacquainted with the fact that there is a science of comparative philology. One of the first papers delivered before this society was upon that subject, and I think it is scarcely fair of Dr. Baylee to teach us that which we may be fairly presumed to know already. He gives us a theory as to the primeval language, which he considers to have been Biblical Hebrew, but on that point I beg to differ from him. I am disposed to think that the language which it pleased God to give to us first was a language very similar to Chinese—a monosyllabic language capable of inflection and all sorts of richness, but still originally monosyllabic, derived from imitation of the sounds of animals, or from the result of man's action on himself, and on all around him. Dr. Baylee, however, apparently considers that the Hebrew tongue was revealed to mankind, and that the Biblical Hebrew in which the Pentateuch was written was exactly the language in which Adam conversed with Eve. If I went at any length now into the subject of comparative philology, I should have to detain you for a long time, and I fear I should exhaust your patience. Although I have made these criticisms on the paper, I cordially agree with the principle laid down by Dr. Baylee that we must be very careful, in interpreting the Scriptures, to ascertain simply, and without reference to any preconceived notions, what the words of the Scriptures do mean, and to adhere to that interpretation, and to that alone, of the Word of God.

MR. WARINGTON.—I must say I do not agree with the view which

Dr. Thornton appears to take, that, when the author of a paper comes before us and makes several mistakes, we should let him off easily, because we happen to agree with some of the general principles which he lays down. If we find him making a large number of mistakes in his paper, that tends to the presumption that there may be something wrong in his conclusions, and we ought therefore to examine the foundations all the more carefully before we commit ourselves to those conclusions. Dr. Baylee gives us a curious argument to prove that Hebrew is the primeval language. He tells us that the names of Adam and Eve, of Cain and Abel, are all significant in Hebrew, and that they are not so even in the cognate languages. In order to test the validity of these derivations, assumed or stated, I turned up the highest authority I had access to—Fürost's Hebrew and Chaldee Lexicon. I looked at the root which lies at the foundation of Eve, and I found it quite as significant in Persian, Greek, Arabic, Syriac, and Sanscrit. The root of Noah also was to be found in Sanscrit, in German, and in Arabic. I could not trace the root so well in the names of Adam and Abel, but I found sufficient to tell me that there is no evidence, from the peculiar significance of these names in Hebrew, that Hebrew was the language originally spoken. Then I find a very extraordinary derivation to which Dr. Baylee has committed himself. He tells us that Adam is derived from *dama*, to resemble, but any one who looks at the second chapter of Genesis will see at once that as God formed man out of the *adamah*, or ground, so he afterwards called his name Adam. It is plain that that was the derivation. In the Aryan tongues you get the same derivation for the name of man—in Latin, *homo*, a man, has the same root as *humus*, the ground. I pass over Dr. Baylee's derivation of earth and deep, but a little further on I find him giving *nephesh* as meaning the bodily frame. Now, that word is never so used in the Scriptures. It means simply a breathing, and I cannot conceive how Dr. Baylee can have taken it to mean a bodily frame. Passing from that point, we come to Dr. Baylee's criticism upon the word *bara*, to create, and we are told that that word is only used as a sign of work in a complete state. It would have been worth Dr. Baylee's while if he had turned to a passage in Isaiah, where the word "create" is used synonymously with "make" and "fashion." This is remarkable, because it upsets Dr. Baylee's rule that in the Scriptures those things are said to be created which are perfected, and those things made and fashioned which are incomplete. Here we find, that God *made* the light and *created* the darkness: He *made* the good and *created* the evil. Would Dr. Baylee say that darkness and evil are complete states, and that light and good are imperfect? Yet that is the result of his criticism on the word *bara*. Then he says that the word create is only used with regard to man and woman when both of them have been made, and so the work of their creation completed, the words "made" or "formed" being used in the separate creations of each of them. But if he had quoted the whole text instead of only half of it, he would have refuted himself; for the verse commences by saying, "God created man in his own image,"—the word being used in the singular before "man" alone, before it is put

before "them." Then as to the word *thohu*. It is true that it is used in a sense signifying ruin, but it also means emptiness and desolation, and it does not follow that there could have been no emptiness and desolation arising from other sources than ruin. In Isaiah the usage of the word *thohu* differs considerably, and, looking through the latter half of the prophecy of Isaiah, which some think is by a different hand, I find six places in which *thohu* is used as meaning simply nothing,—nothingness, without the slightest trace of ruin. It also means empty, worthless. Thus the passage which Dr. Baylee quotes from Isaiah may be interpreted to mean that the earth was not created for nothing—that it was not created desolate. If the earth was not created for nothing, for what was it created? In order that it might be inhabited. Isaiah, then, is comparing this *thohu* with the end of creation as something different. God did not create the earth in order that it might remain empty, but that it might be inhabited; which leaves out of the question whether the original condition of the earth was one of emptiness or not. Further on we have a remarkable criticism upon thunder, with the suggestion that it is nothing more than volcanic action. We are told that in all volcanic countries underground volcanic noises are called thunder, and that in Hebrew poetry thunder is represented as the voice of God:—"At Thy rebuke they fled: at the voice of Thy thunder they hasted away." Taking these several points of criticism together, then, we shall have to alter Dr. Baylee's five principles as follows:—"1. In the beginning God gave existence to the earth. 2. The earth was in a state of emptiness and desolation. 3. The character of that emptiness and desolation was that water covered the whole face of the earth. 4. The Holy Ghost was brooding over the whole, instilling life into it. And, 5, In six stages God fashioned (not restored) the earth." Then we come to the flood, and we are told that the flood accounts for the fact that there are no historic nations south of the Torrid Zone. But Dr. Baylee should first have looked at the map to see what field there was for their existence there. There is such an extremely small portion of dry land there that it is hardly reasonable to suppose there would be many historic races upon it. I have also yet to learn the fact, stated by Dr. Baylee, that philologists have been compelled to divide mankind into three great divisions in order to bear out the account of the three sons of Noah. Then we pass on to the reckless way in which Dr. Baylee treats the words *tzurem* and *selang*, as evidences of strict scientific phraseology in the Scriptures. I fail utterly to see the force of his argument, when I know that the word which he says signifies rocks lying in strata also means stones lying in a brook. We are told also that there is a very remarkable agreement between the fortieth chapter of Isaiah and the discoveries of modern science. But do we know as a fact from any scientific discovery that the waters have been measured, that the heavens have been meted out, that the dust has been measured, and that the mountains and hills have been weighed? I suppose my scientific knowledge must be very backward, but I never heard of any scientific discoveries which proved these things. I fail utterly to see how the statement in the twelfth verse comes in

contact with science at all. The idea which Isaiah had was to give the people some notion of the immensity of God. The waters of the earth were no more to Him than a few drops were to a man, which he could take up in the hollow of his hand, and the earth itself no more than a spn. We are told that "He comprehended the dust of the earth in a tierce," because that means a third part, and because the land was divided into three parts, of which the arable land was one. I suppose, if the prophet had written in English, and had used the word "quart," instead of tierce, Dr. Baylee would have discovered that the earth was divided not into three, but into four parts. It is so easy to adjust things, so as to meet your preconceived theories! I must confess that I do not see what is the aim or object of Dr. Baylee's paper, and, not seeing it, I shall not venture to offer any remarks on that head. But whatever it is that he proposes to prove, it seems to me that we shall require fuller and sounder evidence before we can receive it as truth.

Dr. GLADSTONE.—I did hope, from the reputation of the author of this paper, that we should have heard something of great interest to-night. I have often paid attention to this subject, and ever since I was a little boy I have had a great fondness for philological research. I cannot discuss the paper before us at all minutely because of my small acquaintance with the Semitic languages; but wherever I could form an opinion upon it I have found it wrong. When, for instance, we hear it said that Hebrew, or something like the Hebrew of the Bible, was the language of Adam and Eve, it is utterly impossible for me to conceive that any language with grammatical inflections was spoken at that time. I will not go into the various points which have already been dealt with; but my notions as to the philology of Dr. Baylee were at once set at rest when I came to the passage which explains that the Noachic flood has compelled philologists to divide mankind into three great divisions. I suppose the three great divisions into which philologists would divide mankind would be that in which monosyllabic languages are spoken, that in which languages having the syllables agglomerated together are spoken, and that in which languages having grammatical inflexions are spoken. But what all this can have to do with Shem, Ham, and Japhet I cannot possibly conceive. Dr. Baylee's remark can only arise from some idea that has passed out of existence a long while ago. I will not detain you with many remarks upon a matter into which Mr. Warrington has already gone so fully; but I should like to say a word upon the suggestion that if we closely examine the words of the Scriptures, we shall be able to arrive at the conclusion that the sacred writers had some knowledge of natural phenomena, and that that knowledge is in some way embraced in the very words they have used. If that were so, it would be a very interesting fact, and we should have scientific prophecies somewhat analogous to historical prophecies. But if that were not the case, and the sacred writers had only used the ordinary language of their own day, then we have not an evidence of the Divine authorship of the book, but we may have a proof of the antiquity of the book, and a means for looking into the way, and examining

into the period in which certain books were written. I have looked a little into that matter, and I confess it appears to me that Dr. Baylee's view is not carried out. Take that text from the fortieth chapter of Isaiah—"It is He that sitteth upon the circle of the earth." Now, in order to make that square with modern science, the modern idea has first of all to be put into the text, and then to be dragged out of it. Any one looking at the earth knows that it is a circle; but that does not necessarily mean a sphere. There are many passages into which it is not at all difficult to put the ideas of modern science. Take that text which Dr. Baylee says states the process of evaporation—"All the rivers run into the sea, yet the sea is not full; unto the place from whence the rivers came, thither they return again." But it is quite possible that at the time that was written there may have been some other theory as to the circulation of the waters between the sea, the rivers, and the air; and possibly some of these ancient peoples knew more about these things than we give them credit for. But, then, we must look at the other side of the argument, and we find that expressions are used which, unless they are simply figurative, are altogether wrong. We must take all the evidence together, and we are led to the conclusion that the ordinary figurative language has been applied to the phenomena of nature, and in the few cases where the language will accord with the modern discoveries of science we must either conclude that the ancients knew a little more about these things than we had imagined, or else that the result arises from mere accident. I myself have come to the opposite conclusion to that towards which Dr. Baylee seems to tend in this paper. One thing it is very necessary to do in all these studies. It is very necessary to avoid all preconceived notions, and to take the meaning of the words as they are set down, drawing out of each passage nothing more than it actually contains. Take the text, "Let the waters under the heaven be gathered unto one place, and let the dry land appear. . . . The gathering together of the waters called He seas." Is that meant to teach us that all the various seas and oceans are in connection with one another? I am sorry I have been so critical in my remarks; but we have little to do with this paper except to criticise the various statements in detail, because the general principles laid down are those which most students of the Bible would thoroughly acquiesce in, and which have been frequently laid down before.

Rev. C. A. Row.—In the earlier part of Dr. Baylee's paper there is this passage:—"We are conscious of being a unity. Yet how great a complexity! Person, in Greek *ὑπόστασις*, expresses a mode of being, without defining the mode." But it does not mean person or personality: there is a broad distinction between the two. Close after that follows the curious statement, "God and man are united in Christ in one consciousness." Now, I look upon that statement with very considerable doubt, for it appears to me to approach the Monothelite heresy—

Mr. REDDIE.—You would not confound consciousness and will; you would steer clear of that, I suppose?

Rev. C. A. Row.—Certainly. But if God and man have one consciousness,

I do not see how they are to have two wills. At all events, the assertion is a dangerous one, and I did not like to pass it over without calling attention to it. I agree altogether with the general principle, that we should endeavour to ascertain the precise meaning of the words of the Bible as far as possible, and I only regret that Dr. Baylee has not always stuck to his text. There is one passage near the end of the paper which I cordially agree with, and that is where Dr. Baylee says, "Protestant and Romish writers have almost unanimously accepted the meaning of 'the gates of hell' to be the power of the devil and his agents. It is utterly impossible to assign such a meaning to the phrase on any true exegesis." I only regret that Dr. Baylee has not gone further, and demanded the correction of numerous other errors in the English version; and I think the sooner we get rid of some of the notorious ones among them the better—

MR. RADDIE.—Perhaps you would tell us whether you would substitute, for "the gates of hell," Dr. Baylee's interpretation, "the gates of hades," and then explain the meaning.

REV. C. A. ROW.—I should substitute "the gates of the grave." In the well-known text I should put it, "The gates of the grave shall not hold My Church down;" and that, I apprehend, is a positive proof of the resurrection.

REV. MR. WAINWRIGHT.—I share in the disappointment which has been expressed by previous speakers with regard to the merits of this paper; but still I think scant justice has been done to the author in some of the remarks which have been made. I think the paper would have been more valuable if we had had something more distinct and definite instead of an assumption with regard to the origin of language. The two conflicting and opposite theories—the one of Professor Max Müller, and the other opposed to it by Mr. Farrar—Dr. Baylee quietly passes by, siding with neither of them, and not showing any reason why we should not adopt the one or the other. I go some way with Mr. Warrington in his criticisms on proper names, but I scarcely think his premises would sustain the conclusions he wishes to draw from them. Perhaps the first woman was named Eve or Zoe, because she was *ζωον*, a living creature; so called because she was the created spring of life to her descendants. But we cannot make the Scriptures fairly responsible for many of the statements contained in this paper, which assumes, that if the Scriptures be correct, Moses intended to tell us that Hebrew was the language spoken by our first parents. I do not understand that to be stated in the Bible at all. But let me note one circumstance. We know that the founder of the Hebrew people migrated from his fatherland, crossed Mesopotamia and the Euphrates, and settled in that country called Palestine. A short time after that emigration from Mesopotamia we find Jacob going to his unkind father-in-law, and coming back speaking the language of his own family. He designated a certain heap of stones by one name, and his father-in-law called it by another. The one calls it *Galeed*; the other, *Jegar sadutha*, and the language of the father-in-law is precisely the language of Abraham's father. I do not think sufficient notice has been taken of the

fact that the Phœnician speech—the old Hebrew speech—was not the original speech of the Jewish family. The Phœnician was the language of Palestine when Abraham got there, and he adopted it. If that fact is borne in mind, in connection with the other fact, that an immense space of time elapsed between the creation and the deluge, to say nothing of the time from the deluge to the Abrahamic migration, you have a period sufficiently long to account for any change of language introduced and grafted upon the original stock of speech. But if it should be conclusively established that Hebrew was not the original language of the world, you have not touched the integrity of the Biblical narrative at all. The Biblical narrative does not say that it was the original language, and that has always been too much assumed and taken for granted. With regard to the word *Eve*, I must note, that, whatever was the original name in the original language, *Moses*, writing for the Hebrew people, would translate the word into its Hebrew equivalent, just as, if he had been writing in Greek, he would probably have called it *Zoe*. What we are required to hold is, that the names of Scripture stand in precisely the same relation to the language of the Bible that they would originally to the language in which they were given. With regard to the meaning of the words, I hold the view of the present Archbishop of Dublin, who, in his work on the Synonyms of the New Testament, says it is in proportion as we are acquainted with them that we get at the precise meaning of the New Testament. Dr. Gladstone has hinted that the Scriptural writers possessed more scientific knowledge than we have credited them with, and that they were scientifically in advance of their times. Now I think that was not the case, and that it is a mistake to suppose anything of the kind. Dr. Candlish put the matter in this way: the problem to be solved was how could the Divine mind, enlightened in everything and comprehending everything, convey to finite minds the revelation of spiritual and moral truth, which should be, with respect to other truths of revelation, the admiration of each succeeding age, and yet should be so couched as to be always in perfect consistency with other knowledge, and so that the expressions of the Holy Scriptures on scientific matters should teach nothing whatever. We are bound to arrive at the conclusion that we see the action of the Divine mind in this, that the language of the Bible was so framed as not to teach anything on these points more than was known at the time, while at the same time it was so large and elastic as to include all the developments of the scientific truths which have come to light. As to consciousness, Mr. Row will remember that the argument for the identity of the resurrectioned body is, that what proves the identity is the consciousness.

MR. REDDIE.—Strictly speaking, the paper before us is more a paper of exegesis than a scientific paper, but it would be impossible for us quite to exclude papers of this nature from the Institute; and we should bear in mind that it is of great importance to have views of this kind brought forward in a society like this, where they will be met with such opposing criticisms as we have had offered upon the paper read this evening. I find it contains a great deal of what Dr. Baylee has already put forward in his

published books, and it is evidently of the greatest consequence, that if the views are inaccurate which the author enunciates, they should be met with adverse comments such as we have had to-night. But, as Dr. Thornton has already observed, several of the points noticed by Dr. Baylee have been previously discussed here, though Dr. Baylee has not thought it necessary to notice those discussions. I think, however, that any gentleman sending us a paper, should, as a rule, take up the subject from the point at which we have left it, and either accept or refute what appears before to have been put forward; for it is only by pursuing such a course that we can make any way at all. Dr. Baylee has probably had little time at his command, or he may have thought it preferable not to notice our former discussions upon these subjects. In one portion of his paper an extraordinary remark is made about the shape of the earth, assuming that there was once a theory that the earth was a flat, four-cornered body. But the earth, even if supposed to be flat, is obviously circular, and I do not know that those who believed it to be flat ever believed that it was four-cornered—

Mr. WARINGTON.—There was such a theory at one time.

Mr. REDDIE.—Well, at any rate, it is not in Scripture. This is a subject dealt with in some of our previous discussions,* when it was pointed out that in the book of Job the expression occurs “God stretcheth out the north over the empty place, and hangeth the earth upon nothing”—thus showing that the inspired writer considered the earth to be a suspended globe. After the criticisms we have had from Mr. Warington there is not much left to add to the discussion. Dr. Baylee seems to think that the earth is called in the Hebrew “a runner,” because it runs round the sun; but even so lately as his own time, Lord Bacon did not believe this, and I am not at all sure that we shall go on believing it. Some of the author’s arguments are peculiar. For instance, with regard to the sun standing still, he says:—

“By manifesting His power in that remarkable manner over the sun and moon, He gave public evidence, not only to Israel, but to all nations, that He was supreme over all nature. Who can tell the amount of preservation to Israel, and of instructive admonition to all nations, from the Pillars of Hercules to the remote east, which resulted from that one transaction?”

Now who, indeed, can tell? I never knew that any nation except the Jews ever heard anything about it; and I do not know whether even the Talmudists wrote of the sun standing still. One interpretation, however, of the passage is, that God merely suspended the light of the sun by obscuring it in darkness.† With regard to the creation of chaos, I think Dr. Baylee has involved himself in manifest contradictions. In one part of his paper he states that we had light created, and then that *tohu* and *bohu* meant a changed condition, and that the consequent darkness would be a change from the previous state of light. Yet he goes on to tell us that light was created afterwards. But I will not go on with these minute criticisms. I

* Vide *Journal of Transactions*, vol. I. p. 410.

† *Ibid.*, vol. II. p. 162.

am glad the paper has been so thoroughly discussed, as we shall also have Dr. Baylee's reply, and such discussions are a valuable portion of the transactions of this Institute.

The CHAIRMAN.—I agree with Mr. Reddie that the paper has elicited a valuable discussion. There are several, I will not say errors, but apparent misinterpretations in Dr. Baylee's paper. Upon the point as to whether Hebrew is to be considered the parent of all languages or not, I think there is nothing in Scripture to warrant us in coming to that conclusion. On the contrary, the Scriptures themselves, I think, would lead us to consider that Hebrew formed no exception upon the confusion of languages at the building of the Tower of Babel. There may, however, be a question as to what was the nature of that miraculous confusion of tongues.

The meeting was then adjourned.

REPLY BY DR. BAYLEE.

I shall reply to the criticisms on my paper *seriatim* :—

I.—DR. THORNTON.

(i.) The derivation of the word עֶרֶץ (*eretz*), from עָרַץ (*rootz*). Dr. Thornton thinks that *ara* is an important root of the word, and if you compare it with the Aramaic and also with the Greek ἔραζε he thinks that the impression will be confirmed.

Reply.—*Ara* could not be the root, inasmuch as there is no such root in the Hebrew; and if there were, the radical *z* would be unaccounted for. With regard to the Aramaic, the testimony is decisive that *z* or its cognate forms part of the root: e.g.—Syriac ܐܪܐ Chaldee ܐܪܐ Samaritan ܐܪܐ. Further, the Arabic is أَرِى (a.r.d.). The formation עֶרֶץ from עָרַץ is the ordinary rule of Hebrew formatives: e.g.—בֶּנִי (eben), a stone; בָּנִי (banāh), to build; אֲגֻדָּה (aguddah), a knot; גָּד (good), to press. The reference to ἔραζε (earthwards) must be a mistake, for the ζε is merely adverbial, and no part of the root. This reduces the word to *epa*, which gives no account of the radical *z*. A Greek root would in any case be an improbable original for a Mosaic word.

(ii.) Dr. Thornton says:—In obtaining the derivation of *thedom*, or deep, I should commence with the word *thohu*.

Reply.—Adverbs are formed in Hebrew by the addition of מ (m), e.g.—*ammam*, verily. But nouns are not; and unless Dr. Thornton can show some case in which a noun is so formed, he is not at liberty to derive *thedom* from *thohu*. On the other hand, the formation of a verbal noun by prefixing ת is the ordinary character of the language: e.g.—תַּאֲוָה (tha-a-vah), desire, from אָוָה (a-vah), to desire; תְּבוּאָה (theboo-ah), produce, from בָּוָה (boh), to bring forth.

(iii.) Dr. Thornton says :—I think that Dr. Baylee wants to point out that the language of Scripture is very peculiar.

Reply.—The leading object of my observations on the Hebrew language was to deal with it on the same principles as other languages, viz.,—to examine its structure, and its *usus loquendi*.

(iv.) Dr. Thornton thinks that the question of language was fully discussed on a former occasion, when he read a Paper on the Logic of Scepticism ; and that Dr. Baylee cannot have read the *Journal of Transactions*.

Reply.—I read that Paper carefully, but do not think it would be quite in place to criticise it here, as my sole object is to defend my own statements. Nothing was further from my thoughts than to assume any previous writer's ignorance of the science of comparative philology. I am thankful to say I had in view a much higher object.

(v.) Dr. Thornton thinks "that the language which it pleased God to give to us first was a language very similar to Chinese, a monosyllabic language capable of inflection, and of all sorts of richness, but still originally monosyllabic, derived from the imitation of the sounds of animals, or from the result of man's action on himself, and on all around him."

Reply.—This is a conjecture wholly unsupported by any known language, and at variance with all ascertained facts.

(vi.) Dr. Thornton says :—Dr. Baylee, however, apparently considers that the Hebrew tongue was revealed to mankind, and that the Biblical Hebrew in which the Pentateuch was written was exactly the language in which Adam conversed with Eve.

Reply.—I do not think that God revealed a language to Adam beyond such limits as to enable Adam to receive the necessary admonitions and instructions which belonged to his primeval state. I consider the language of the Pentateuch to be a considerable modification and enlargement of that limited primeval language, retaining its original features.

II.—Mr. WARINGTON.

(vii.) Mr. Warington says :—"Dr. Baylee gives us a curious argument to prove that Hebrew is the primeval language. He tells us that the names of Adam and Eve, of Cain and Abel, are all significant in Hebrew, and that they are not so even in the cognate languages."

Reply.—In attempting to deal with the argument, Mr. Warington could only find two names which he even alleged to have cognates. Mr. Warington's failure in all the rest confirms the validity of my assertion. The following test will enable the reader to judge for himself :—Adam : man in the divine image. Seth : substituted by. Enosh : man in misery. Cainan : lamenting. Mahalaleel : the Blessed God. Jared : shall come down. Enoch : teaching. Methuselah : his death shall send. Lamech : to the smitten. Noah : consolation. Mr. Warington has referred to Persian, Greek, Arabic, Syriac, Sanscrit, and German. Let him write out those proper names in any one of these languages and show them to make a significant sense, and then, but

only then, will he have answered me. The proper names of the Bible are more or less found in all languages, but are significant only in Hebrew ; consequently Hebrew was their original. George is significant only in Greek ; therefore Greek was its original. This is the argument which is left untouched.

(viii.) Mr. Warington objects to the derivation of Adam from *dama*, to resemble. He shows that *homo* and *humus* are closely connected, and so Adam and Adama may be.

Reply.—Adam is not a grammatical derivative from Adamah : the reverse would be the case. On the other hand, I have shown in No. 1 that Adam is grammatically formed from *dama*.

(ix.) Mr. Warington asserts, that *nephesh* is never used for a bodily frame.

Reply.—In Num. xix. 11, *nephesh* is used for the dead body of a man.

(x.) Mr. Warington asserts, that in Isaiah xlv. 18, *bara* (create) is used synonymously with "make" and "fashion."

Reply.—No expressions of Scripture are tautological.

(xi.) On the passage "the Lord creates evil," Mr. Warington asks, would Dr. Baylee say that darkness and evil are complete states, and that light and good are imperfect ?

Reply.—"Evil" and "darkness," in Isaiah xlv. 7, are used for what we call "the ills of life." God claims them as His creatures, and they are perfectly adapted for their assigned work in His providential dealings.

(xii.) I confess myself unable to see what Mr. Warington meant by quoting the whole verse in Gen. i. 27 : "So God created man in His own image, in the image of God created He him : male and female created He them." Surely "create" means the same in both parts of the passage.

(xiii.) On the word *thohu*, Mr. Warington thinks he disproves my assertion that it means ruin by producing the following translations of the word :—nothing, nothingness, empty, worthless, emptiness, desolation.

Reply.—Let us substitute those translations for the received one :—the earth was nothing ; the earth was nothingness ; the earth was empty ; the earth was worthless ; the earth was emptiness ; the earth was desolation. Is that not a state of ruin ? I should have been glad if Mr. Warington had answered my real arguments :—1. *Thohu* and *boh* are found only three times, and twice confessedly for ruin, the consequence of sin : why not the third time ? 2. The ruined state of Jerusalem is described as the city of *thohu*. 3. God expressly declares that He did not create the earth *thohu*. 4. Why is *thohu* never applied to heaven ?

(xiv.) Mr. Warington ascribes to me the idea of confounding thunder with volcanic action.

Reply.—I simply stated the fact that in all volcanic countries the rumbling noise of earthquakes is called thunder, in illustration of "at the voice of Thy thunder they hasted away."

(xv.) In reply to my statement that there are no historic nations south of the Torrid Zone, Mr. Warington says, "Dr. Baylee should have first looked at the map to see what field there was for their existence there."

Reply.—In looking at the map, we see Australia, New Zealand, a large part of South America, and part of South Africa. These are not an extremely small portion of the earth, and they are well fitted for the habitation of man. The remarkable facts therefore remain untouched :—1. There are no historic nations south of the Torrid Zone ; and 2. No terrestrial animals are found in the same parts which could not have crossed the Torrid Zone.

(xvi.) Mr. Warington further ascribes to me the statement that philologists have been compelled to divide mankind into three great divisions in order to bear out the account of the three sons of Noah.

Reply.—As I neither said nor believe that they did so, I need only refer to the paper for what I did say.

(xvii.) Mr. Warington speaks of “ my reckless way of treating *tzoor* and *selang* ” : and asserts that the word which indicates rocks lying in strata is also applied to stones lying in a brook.

Reply.—The word is never so applied. But if it were, my illustration of that beautiful passage would not be affected by it. Mr. Warington does not deny that *selang* means a projecting rock such as Moses could strike, and that *toor* is the proper name for a rock lying in strata. Consequently the exposition remains untouched.

(xviii.) Mr. Warington's next three questions are somewhat remarkable :—
1. Do we know as a fact from any scientific discovery that the waters have been measured ? Or, 2. That the heavens have been meted out ? Or, 3. That the mountains and hills have been weighed ?

Reply.—With so eminent a scientific gentleman present as the one who occupied the chair, I cannot conceive how such a question should have been left unanswered. Had Mr. Warington asked for the information before the meeting assembled, he would have been saved the trouble of asking the questions and have ascertained that these are facts.

(xix.) I hardly know whether I should give a reply or a rebuke to the manner in which Mr. Warington speaks so lightly of inspiration, in his observations about a tierce or a quart. Surely when the Omniscient One inspired Isaiah to speak of a third part, he meant a third part.

III.—DR. GLADSTONE.

Dr. Gladstone gives a theory of monosyllabic primeval languages, which I have already sufficiently answered. Baseless theories are the bane of true science.

(xx.) On Isaiah xl. 22, “ He that sitteth upon the circle of the earth.” Dr. Gladstone observes, that any one looking at the earth knows that it is a circle ; but that does not necessarily mean a sphere.

Reply.—The general charge against the ancients is, that they thought the earth to be flat. I do not think it natural to say of a man sitting in a vast plain, that he is sitting on the circle of the earth.

(xxi.) Dr. Gladstone asserts that there are only a few cases where the figurative language of Scripture will accord with the modern discoveries of

science, and even ascribes error to some expressions of Scripture unless figuratively taken.

Reply.—This is a statement which I am grieved to find uncorrected in a meeting of the Victoria Institute. It is wholly contrary to fact. It is no answer to the scientific accuracy of Genesis i. 9, and Eccl. i. 7, that there may have been some other theory at that time. The true question is, do the inspired words there employed agree with true science?

IV.—Rev. C. A. Row.

(xxii.) Mr. Row asserts that the Greek *ὑπόστασις* does not mean person or personality, and that it approaches the Monothelite heresy to say that God and man are united in Christ in one consciousness.

Reply.—Were our translators wrong in rendering *ὑπόστασις* person in Hebrews i. 2 :—"The express image of His person"? Or the ecclesiastical statement :—"Three Persons and one God"?

V.—Rev. Mr. WAINWRIGHT.

(xxiii.) He asserts that Abraham learned Phœnician in Canaan, and gave up his native language.

Reply.—The only proof he offers is that Laban used an Aramaic dialect. I think we may safely reject a theory founded on such a basis.

VI.—Mr. REDDIE.

(xxiv.) He says that I spoke of a second *creation* of light.

Reply.—This use of the word "creation" appears to me to be a good illustration of the difficulty which originates from not attending to the accuracy of Scripture phraseology. The *creation* of light was at the primary creation of all things. Not in the universe, but upon earth, there was subsequent darkness when the earth became *thohu* and *bohu*. At the renovation of the earth in six days, the first act was "God said, Let there be light." There was, then, in *this earth* intermingled light and darkness. The second act was, "God divided the light from the darkness." The one was evening : the other, morning. This does not prove that there had been no pre-existing light on earth, much less that the universal light was extinguished. The six days' work is an earthly scene. We have two beautiful parallels from the Scripture itself,—one from Jerusalem, the other from the human soul. Jerusalem, in David and Solomon's days, was in light and peace. Her people's sins had reduced the land to darkness, her Saviour's return will more than restore the land to light. The second condition is described by Jeremiah, in the very terms employed by Moses :—"I beheld the earth, and, lo ! it was without form and void ; and the heavens, and they had no light." The third condition is thus predicted, "Arise, Shine ; for thy light is come, and the glory of the Lord is risen upon thee." Regarding humanity as a whole, the Bible history of the human soul is parallel. First, God created man in His own image, which surely was a state of light. The condition of fallen man is

this :—Darkness hath covered the land, and gross darkness the people. His renewed condition is this :—God, who commanded the light to shine out of darkness, hath shined in our hearts, to give the light of the knowledge of the glory of God in the face of Jesus Christ. The last parallel may be carried farther. Our present spiritual life is intermingled light and darkness. The resurrection state will be the morning. The account of the fourth day's work is not of the creation of light, but of assigning to the sun and moon their functions in an atmosphere. It would occupy too much space to enter into the verbal criticism of the Mosaic statement there.

VII.—THE CHAIRMAN.

(xxv.) He made a general statement that Hebrew formed no exception to the confusion of languages at Babel. He offered no proof of this.

Reply.—I should have been very glad if Mr. Mitchell had stated what he considers misinterpretations, for his papers in the *Journal of the Institute* I have found always valuable and instructive. May he long continue to render equal service to Divine truth and to real science !

I have now answered in detail all the criticisms on my paper, and I must conclude by expressing my great disappointment that the general principles of the paper have been so little criticised. Where so much has been said, I hope I may take this fact as an indirect proof that they are correct. In my opinion, the truth and the interpretation of Scripture should always be handled with reverential earnestness ; and even in human science, we should remember that national history, human language, and natural phenomena are all God's work.

ORDINARY MEETING, MAY 18, 1868.

CHARLES BROOKE, Esq., M.A., F.R.S., F.R.C.S., VICE-PRESIDENT, IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed, and the election of the following Second Class Associate was announced :—

Lieutenant Edward F. Day, R.N., H.M.S. "Malabar," Bombay Harbour, East Indies.

The following paper was then read :—

*ON THE COMMON ORIGIN OF THE AMERICAN RACES
WITH THOSE OF THE OLD WORLD.* By the
REV. J. H. TITCOMB, M.A., Mem. Vict. Inst.

IN the year A.D. 1486, the prior of the Dominican convent at Salamanca summoned a meeting of divines for the purpose of investigating the alleged discovery of a new world by Columbus. It was a period of intense excitement. Up to that moment, science and Scripture had alike been made to teach that the world was round like a plate. The voyage of Columbus, and the theory which he propounded, completely overthrew that opinion. It produced, therefore, the greatest consternation among all orthodox divines. At the solemn conclave just mentioned, it was seriously contended that Columbus could not be right; otherwise St. Jerome and St. Augustine must have been wrong. Among the arguments it was also contended that, however easily Columbus might have crossed over the ocean on the downward side of the sphere, yet he never could have sailed up-hill in coming back again! But the reason which appears to have finally decided them in the rejection of the new theory was its incompatibility with Scripture; "since to believe in inhabited lands on the opposite side of the globe would be equivalent to maintaining that there were nations not descended from Adam, it being impossible for them to have passed the intervening ocean"! *

* Wilson's *Prehistoric Man*, vol. i.

I. This alternative, however, is by no means clear. Herodotus records a voyage of the Phœnicians, made in the seventh century before Christ, around the whole continent of Africa. Pliny states the same thing of the Carthaginians. These accounts, if true,—and there seems no good reason why we should doubt them,—must not only have involved very prolonged sea voyages, but have not improbably brought the voyagers into contact with the islands of Madeira, the Canaries, Cape Verde, and Azores. At all events, they upset the notion of those worthy Dominican friars at Salamanca who imagined that, in remote ages of the world, oceanic migrations of any great length were impossible. It may be replied that these were only coasting voyages, from which no argument can be drawn in relation to the open navigation of the Atlantic or Pacific. If so, a clearer and more satisfactory inference upon that subject might be drawn from the discovery and colonization of Greenland in the year A.D. 985, or thereabouts—a fact which is of strictly historical authority, and is actually confirmed by the existence of Runic inscriptions in that country. From this fact it will be seen that before the time of Columbus, the Northern Atlantic Ocean must have been traversed by Scandinavian sailors, and the mainland of America safely reached. Still more to the point is the following fact. In the year A.D. 1499, a portion of the Portuguese fleet was carried across the Atlantic by the equatorial current, resulting in the discovery of Brazil. And to show that these accidental driftings have not been always from east to west, but sometimes in the opposite direction, let me adduce two more recent cases of the same kind,—instances in which vessels have made long and dangerous voyages both over the Pacific and the Atlantic.

About the year A.D. 1750, for example, a canoe, which is now preserved in the museum at Aberdeen, was picked up by a ship on the Aberdeen coast, with an Eskimo in it, still alive, surrounded by all his fishing-tackle*—a circumstance which shows how easily oceanic currents may convey even uncivilized man across vast tracts of water. Similar cases have happened in the Pacific Ocean. In the year A.D. 1833, a Japanese junk was wrecked on the coast of Oregon, and some of its crew were subsequently rescued from captivity among the Indians of the Hudson's Bay Territory. Evidences exist, also, of a remote system of oceanic navigation among the Polynesians. Pickering, of the United States Exploring Expedition, says, "The Tonga people are known to hold

* Wilson's *Prehistoric Man*, vol. i., p. 148.

intercourse with Samoa, the Fiji Islands, and the New Hebrides." But there is a document published before those seas were frequented by whalers and trading vessels, which shows a more extensive aboriginal acquaintance with the islands of the Pacific. I allude to the map obtained by Forster and Cook, from a native of the Society Islands, which has been shown to contain, not only the Marquesas, and the islands south and west of Tahiti, but the Samoan, Fiji, and even more distant groups. The most remarkable fact, however, is that one of the Hawaiian headlands has been found to bear the name of "the starting-place for Tahiti"—the canoes, according to the natives, leaving in former times at a certain season of the year, and directing their course by a particular star."*

Facts like these are quite sufficient to prove that oceanic migrations, in very early periods of the world's history, might easily have conveyed mankind either from the east or the west to America. The bare possibility of such a thing, therefore, to say nothing of its probability, ought to convince any careful and conscientious mind that there is no *à priori* necessity for supposing the aboriginal inhabitants of America to have been created there independently of Adam.

If we examine this matter somewhat more minutely, it will be found that no fewer than five distinct routes to America were available for primary migrations from the Old World—three from the Asiatic and two from the European side.

In the *first* place, there was the route from the north-east of Asia, across Behring's Straits; in favour of which are the two following arguments, viz., the nearness of the opposite shores, and the evident continuity of population scattered along these coasts, as proved both by their physical affinities and by the agreement of their languages. This is admitted on all hands. To be perfectly candid, however, it ought to be allowed that, from a mere ethnological point of view, this migration might just as reasonably have taken place from America to Asia as the other way. While I urge this route, therefore, as perfectly possible, I dare not attempt to enforce it as a necessity.

Secondly, there was an oceanic route from Japan and the northern islands of Polynesia. This, indeed, seems to have been a highway marked out by Nature herself, inasmuch as at certain seasons of the year strong easterly currents uniformly run from the China seas in the direction of Polynesia and America. Pickering, who has been already quoted, tells us

* Pickering's *Races of Man*, p. 298.

that the northern extremity of California is most "favourably situated for receiving a direct arrival from Japan." He informs us that a few years ago a Japanese vessel was fallen in with by a whale-ship in the North Pacific; that another was wrecked on the Sandwich Islands; and that a third drifted to the American coast near the mouth of the Columbia river,* in the Oregon territory, to which I have before alluded. Under these circumstances, there is not only nothing improbable, but everything in favour of there having been occasional arrivals from the eastern coasts of Asia—first in the northern islands of Polynesia, and afterwards in the Oregon territory of America—even in remote periods of the world's history.

Thirdly, there was a south-eastern route through the Pacific by means of a current called the Antarctic Drift. A vessel, for example, sailing southward from Easter Island would soon get within this powerful stream, and might easily find herself floating toward the coasts of Chili and Peru. In fact, this part of the Antarctic Drift is laid down upon our modern charts as the "Chili Current." Nothing, therefore, was more likely to have happened in remote ages of the past than that some of the inhabitants of Easter Island should have drifted to that part of the American coast. It might be urged, however, that, if so, there ought to be some bond of connection still preserved between the two countries. I think there is, inasmuch as homogeneous architectural remains can be traced almost continuously from South India to Central America.

The Buddhist temples of Southern India and of the islands of the Indian Archipelago correspond with great exactness in all their essential and in many of their minor features with those of Central America. They are built (particularly those of more ancient date) upon terraces, some of which are of great height and extent, being faced with brick or stone, and ascended by flights of steps. They are crowned by structures often pyramidal, the stones forming the roofs of the chambers overlapping each other. Beside these buildings, erected on terraces, there are other analogous structures called *dagobas* in Ceylon, and *topes* in Hindustan, combining the temple and the tomb, usually of the pyramidal form, and generally containing relics of some sort, deposited in a small inner chamber.† In the third volume of the Transactions of the Royal Asiatic Society there is an account of the ruined city of Anarājapura, in Ceylon, whose structures have decided resemblances to

* Pickering's *Races of Man*, p. 297.

† See this subject pursued more fully in *American Archaeological Researches*, p. 88.

those of Central America. Among these is the "Temple of a Thousand Pillars," consisting originally of 1,600 standing on a square. So, from the top of the lofty temple at Chichenitza, Mr. Stephens saw groups of upright pillars standing on a square. He counted 380, and then gave up the work, because so many were broken. The great temple of Bora Bodu, in Java, might be equally mistaken for a Central American temple. Passing thus from Southern India, through Ceylon and Java, into Polynesia, we still trace out the same sort of remains. Mr. Ellis, in his *Polynesian Researches*,* says that pyramidal structures are to be found in many parts which are essentially temple tombs. One at Atehuru is described as having been built of stone, 270 feet long, 94 feet broad at the base, and 50 feet high, with a flat top, reached by a flight of steps. Another at Mawa is 120 feet square. He tells us also that Easter Island abounds with these structures, erected of stone, cut and laid together with great precision. Colossal statues often crown their summits, some not far from 30 feet high, and 9 feet in diameter. This seems to be fair evidence of an ancient oceanic migration of South Asiatic races, which at last reached the coast of Chili or Peru, and carried civilization into Central America. To my own mind, it would seem that the Malay race followed this early stream of migration at a much *later* period—mingling with, if not supplanting it, and driving it onward unconsciously toward the New World. I found this opinion on the fact that while the present Polynesian languages are all essentially allied to the Malay, they are also connected with the languages of America, though *those* have no affinity with the Malay—a condition of things which would be exactly accounted for on the supposition just thrown out.

Let me now indicate a *fourth* possible line of migration from the Old World to the New, traceable by means of the great equatorial current which sets in a westerly direction from the Gulf of Guinea, and flows toward Brazil and Guiana. Had any of the Carthaginians—to whom Pliny alludes as fearless navigators—been driven, when coasting round Africa, into this strong current, they might have found themselves on the South American continent. If it be possible for us to imagine that any of the Guanches from the Canary Islands had met with this fate, the analogies presented between their mummied rock-caverns and the rock-cavern of Atarupe would then be easily explained.

There remains a *fifth* route of possible migration, viz.,

* Vol. i., p. 261.

from Iceland to Greenland. The fact that this was effected before the time of Columbus proves that it was not improbable even in an earlier age. This probability is strengthened by the fact that an inscription of an apparent Runic character was discovered some years ago on an island off the coast of Maine. Another remarkable inscription was found among the excavations of Grave Creek, engraved on sandstone, containing at least four or five Runic letters. As late, also, as 1859, a stone axe was ploughed up in New Jersey, having apparently Runic characters carefully inscribed upon it—known among the American ethnologists as the Pemberton axe. Facts such as these cannot be overlooked. Possibly, when further discoveries shall have increased our knowledge by accumulated facts, we may be able to speak upon the subject with greater confidence.

What I have attempted to show, thus far, is that an entrance into America, both from Asia and Europe, was not only possible, but probable, even in prehistoric times. In other words, the unity of the native American races with those of the Old World, considered as a question of descent and of common origin, not only finds no insuperable difficulty from the oceanic isolation of the great Transatlantic continent, but is almost suggested to us by a variety of well-ascertained facts.

II. In coming to the next subject, viz., the analogies which may be traced between the LANGUAGES of America and the Old World, it will be necessary to proceed with the greatest caution; for it is not by discovering a word here and a word there seeming to agree with corresponding roots among all these various families that we can safely infer any true affinity between them. To speak on this subject with prudence and wisdom, it will be needful to observe two most rigid rules: 1st., To take no notice of any apparent identity among words which are evidently based upon imitative sounds. 2ndly, Never to deduce an affinity between any of the New and Old World languages on the ground only of root words existing in common between them; unless, indeed, the same roots appear and reappear, in many distinct tongues belonging to large family groups on both sides. In that case, I think, the widespread distribution of common root words can scarcely be referred to accidental resemblance; still less can they have arisen from recent intercourse. In all other cases, however, it will be necessary to go beyond such analogies. Hence I add (3rdly), Never to deduce an affinity in such cases between any of the New and Old World family stocks, unless there be a certain intercommunity of

grammatical construction, or idiom, as well as of root words.

The faintest of these affinities, perhaps (as might naturally have been expected), is that existing between the *Aryan* and *American* families of language. That there are Sanskrit roots in some of the latter is beyond all dispute. Take (e. g.) the Quichua, or ancient language of Peru, in which the sun is called *inti*, reminding us of the Sanskrit *indre*. Love is called *munay*, reminding us of the Sanskrit *manya*; and great is called *veypul*, reminding us of the Sanskrit *vipulo*. In the Chayma language, also, we find *az*, to be, reminding us of the Sanskrit *asmi*, I am. And in the Yucatan language we have the numeral one, which comes from the Latin *unus*, evidently reproduced in the word *hun*. Nor must we omit to notice that whereas *vári* in the Sanskrit means water, there is an American root word called *par*, which in Quichua takes the shape of *para*, for rain; and in the Caribbean and Brazilian tongue, the shape of *parana*, for sea. But, notwithstanding such analogies in the vocabularies of the Old and New World, the idioms and constructions in each are very dissimilar, so that any argument for direct affinity between them becomes weakened. One interesting similarity of idiom, however, may be noted. In Chayma they reckon the year by the rains of winter; "so many years" being expressed by the idiom, "so many rains," which is the case in Sanskrit. It is possible that further researches may discover other such analogies, every addition to which would be a fresh link in the chain of evidence.

A consideration of another analogy which the American languages present to those of the Old World will bring us to the ancient *Euskaldune*, or *Iberian*, spoken in Spain before the migration of the Kelts into Europe. This, however (unlike the former), unites the Old World with the New more through certain peculiar characteristics of grammatical construction than through roots common to their various vocabularies. It is well known that the American tongues are extremely agglutinate, compounding many words by mutilation into one aggregate word of great length. The same characteristic is traced in the modern Basque, which is a direct descendant from the *Euskaldune*. Again, the location of thoughts in these agglutinate words is the same. Thus in Chayma, instead of saying, as we should, "I do not know," they would say, "Not knowing, I am." Exactly the same sort of inversion takes place in the Basque. For example, instead of saying "I love him," it would say, "I loving, have him." Again, the sound of *f* is wanting in most

of the American tongues. So in the Basque. Finally, in both there is a strong dislike to any immediate joining of mute and liquid consonants. These analogous characteristics are very striking, and naturally lead us to the supposition that the languages at some remote period, since which their vocabularies have been changed, were derived from the same parent stock. In confirmation of this relationship, a few of their common root words may be noted. Thus in Basque we have for sun *egusquia*, which might easily have sounded like the word, in Choctaw, *hushke*. For hand, *es-cua*; in Chilian, *cue*. Compare *gua*, in Ottomi, for foot. For I, *nic* or *nik*; in the Chinook tribe of Columbia, *naik*; and in another of the Columbian tribes, *innik*. Further researches into this branch of the subject seem to me to be peculiarly desirable, and would tend, I have no doubt, in a very helpful manner to strengthen the force of this most interesting argument.

Let us now look at the *Semitic* family of languages, which is certainly represented in those of America. A valuable paper* in the Transactions of the American Ethnological Society tells us that in *all* the languages of that continent which have been investigated "the Possessive pronouns united with the noun, and the Personal pronouns in both the nominative and oblique case united with the verb, form but one word." Thus, "my son," "thy father," "I love thee," "he sends him," are each represented in the American languages by simple words. Now this construction, it is well known, marks the Hebrew and other Semitic languages. So far, then, the connection is direct and plain. Nor is it without companionship in regard to vocabularies. For example,—sun, which in the Pareni language is *camosi*, in Phœnician is *chemosh*; tree, which in Choctaw is *itte*, is in Hebrew *aits*; the verb to fetch, which in Algonkin, is *naten*, is in Hebrew identically the same.

If we pass to the *Mongolian* family of languages, we shall come upon even clearer affinities than these; not so much, however, from grammatical as from widely spread verbal relationships, far too numerous to specify in this place. Take the word man as a first example. On the Mongolian side we have Kamboja, *mans*; Chinese, *nan*; and Samoyede, *ninec*; among all of which we observe a marked repetition of the root *nan*, or *nin*. So on the American side. Thus in Algonkin we have *nenao*; Athapaska *dini*; Chippeway, *inini*; Iroquois, *nenekin*; Blackfeet, *ninao*; Huasteca, *inic*; Quichua, *ninac*; Ottomi, *nanyeke*. Take the various re-

* By M. Gallatin.

lationships, again, which can be traced among words of family kindred on both sides. On the Mongolian, in Lapp *akha*, for wife; in Ostiak, *ika*, for husband; in Turkish, *acha* for elder brother. On the American side, we have in Greenland *aka* for uncle, while in Ottawa *aque*, and in Dakota *waka-angka*; and in Umqua, *ekhe*; all stand for woman. I will only add two more specimens. On the Mongolian side, for the word fish, we find in Samoyede, *kole*; in Lapp, *quolle*; in Chinese, *kho* (a river); in Mantschu, *golo* (the bed of a river). On the American side, we have in Eskimo, for fish, *khallu*; in Choctaw, *kullo*; in Cathlaskan, *calla*; and in Cherokee, for perch, *agaula*. Again, on the Mongolian side, for child, we find *esi*, in Samoyede; while in Canton, *dszi*; and in Mian, *sa*; and in Kuanchua, *dsu*, for son. On the American side, we find in Ojibbewa, for child, *anesi* in Choctaw, *ussi*; while in Ottomi, *iso* stands for son, and in Chinook, *asa* stands for daughter. These, and other root affinities, seem to me to be too widely dispersed, and too regularly connected with one another, to be accounted for on the ground of mere accident, especially when we recollect the almost endless variety of forms into which these divers languages throw their words.*

Evidences, also, of strong philological relationship exist between the languages of South America and those of *South India*, through the intermediate links of Australia and Polynesia. The first striking analogy which I note between some of the American family of languages and those of the Deccan in South India, is traceable in the pronouns I and Thou, conveyed intermediately through the Australian dialects. Thus in the Deccan family, I is represented by *numu*, *nenu*, *nan*, *nyan*. In the proximate Australian family, *nyan* is represented by *nganya* and *ngai*. In the American stage of transition, *ngai* takes the form of *naiki* (Upper Chinooks); and *nganya* of *yung* (Mosquito). The Cayuse say *ining*. The same appears in relation to Thou. In the Deccan dialects we have *ni*, *nin*, *ninna*; in the Australian, *ninna*, *ningte*, *nginne*. In the American, the Loucheux Indians say *nin*; the Mosquito, *nan*. Analogies exist also in grammar, by which Polynesia becomes a link as well as Australia. The Polynesian family (*e. g.*) contains two personal pronouns *we*—one including the person addressed, like our own; and the other excluding them. A missionary was once preaching in Tahiti, when he said, "We are great sinners;" but using the wrong

* The relationship of the American languages to the Samoyede is well brought out in a contribution to the Philological Society by L. K. Daa. See volume for 1856.

pronoun, he only conveyed to his audience the idea that he and his fellow-missionaries were exclusively great sinners. This is a striking peculiarity of speech. Yet it exists in many American languages, and is common to the Australian and Polynesian. Other links of relationship between the Asiatic and American races may be also traced through the languages of Polynesia, especially in the determinate significance of the formative particles on the verbal root. The Rev. R. Garnett, in a paper read before the Philological Society,* observes, "We may venture to assert, in general terms, that a South American verb is constructed precisely on the same principle as those in the Tamil and other languages of South India, consisting, like them, of a verbal root—a second element defining the time of the action, and a third denoting the subject or person." In Polynesia, too, "verbs have few if any inflections, the want of which is supplied by affixed particles, which are used to designate tense, mood, and voice." Time is, perhaps, less regarded than the place where the action is performed; and this is carefully expressed by the locative verbal form. The directive particles indicate (*e. g.*)—as in the Oregon language—the direction of the action, whether from or toward the speaker. Thus, in the Cherokee, *wai*, he is going away; *tayai*, he is coming near; *nai*, he is going by.

Putting all these linguistic affinities together, the evidence of some primeval connection between the Old World and the New, which we previously traced out as probable, even from a consideration of the oceanic currents, now assumes a far more definite character. Let us see how this evidence may be strengthened by a comparison of certain social customs which exist in common between America and the rest of the world.

III. The first I bring forward is of so extremely peculiar a nature that nothing but some common origin appears at all capable of explaining its existence among races otherwise distant and diverse. Strabo tells us that the Iberian women in the north of Spain, after the birth of a child, used to put their husbands to bed, and nurse them as invalids for a given time.† This practice still exists among the modern Basques, of whom it is said that after the birth of a child the husband goes to bed, taking his baby with him, and then receives his neighbours' compliments.‡ Diodorus Siculus notices the same custom as existing among the natives of Corsica.§ Others have

* Vol. i., p. 271.

† Strabo, III., 4, 17.

‡ Michael, *Le Pays Basque*, p. 20.

§ Diodorus Siculus, V., 14.

recorded it of the aborigines in Pontus, at the south of the Black Sea. Marco Polo found it also in a certain part of China—probably some of the aboriginal tribes who retained the very earliest and most primitive customs of mankind. This strange practice, however, appears beyond all mistake in South America and the West Indies. Among the Caribs, when a child is born, the mother soon goes to her work, while the father takes to his hammock, and is visited as though he were sick.* Among the Abipones, it is said, “No sooner do you hear that the wife has a child, than you see the husband lies in bed, huddled up with mats and skins, lest a ruder breath of air should touch him.”† The inference I draw is that in some remote manner, now unknown and perhaps impenetrable, there must have been an affinity between the ancestors of these American tribes and the aboriginal populations of Europe and Asia.

A conclusion of the same kind may be drawn from another extraordinary set of customs which are found in Central Asia and some of the islands on the south-east of that continent. I refer to certain prohibitions of social intercourse existing in these places between parents-in-law and children-in-law—prohibitions so far out of the ordinary course of life that we can only wonder at their origin. Among the Mongols and Kalmucks, for example, a young wife must never speak to her father-in-law; nor may she sit in his presence.‡ Among the Dayaks of Borneo a married man must not even pronounce the name of his father-in-law. Similar customs are also found in the Fiji Islands, and some parts of Australia. Now such are also found in America. In the south, among the Arawaks, “it was not lawful for the son-in-law to see the face of his mother-in-law. If they lived in the same house, a partition must be set up between them. If they went in the same boat, she had to get in first, so as to keep her back turned towards him.”§ Among the Caribs, all the women talk with whom they will; but the husband dares not converse with his wife’s relatives, except on extraordinary occasions. In the north, near the Rocky Mountains, among the Omahas, the father and mother-in-law never speak to their son-in-law, nor mention his name, nor look in his face. The same custom prevails among the Crees and the Sioux tribes. What can be the cause of this abnormal unity, unless it be the relic of some primeval practice dating from a very early period of history, when the ancestors of these races were in much closer proximity than

* Tylor’s *Early Races of Mankind*, p. 288. † Idem, p. 290.

‡ Idem, p. 286.

§ Idem, p. 284.

they are now? Facts like these, I contend, are extremely valuable, and supply us with a species of evidence on this subject which strongly augments the force of all that has preceded.

The same may be said of another very remarkable social custom which obtains in the western extremity of Ceylon, and which has acquired the recognition of law, whereby nephews on the sister's side succeed to the inheritance of the possessor, even to the exclusion of his own sons. "This anomalous arrangement is observed in various parts of India, in Sylhet, and Kachar, in Canara, and among the Naïos in the south of the Dekkan. The guardianship of the sacred island of Ramiseram is vested in a chief of the tribe of Byragees, who is always devoted to celibacy, the succession being perpetual in the line of his sister."* Exceptional as this practice is, however, Humboldt assures us† that the same thing can be traced among the North American Indians,—the Hurons and the Natchez preferring the female to the male line, and setting aside the claims of the direct heir in favour of the son of a sister. How any custom, so far removed from all the ordinary usages of mankind, could ever have originated in these separate countries, from independent and unconnected causes, I am at a loss to imagine. But on the theory that some of the South Indian tribes found their way to America, as we have seen already to be probable from our philological argument, all is made plain.

IV. This connection between India and North America reminds me of certain mythological affinities which may be traced between them, especially in relation to serpent worship, which we will now proceed to consider.

Every student of these subjects is familiar with the fact that some form of serpent worship runs throughout the Old World. In the mythology of ancient Babylon, the temple of Belus contained an image of Juno holding in her right hand the head of a serpent.‡ In the mythology of ancient Persia, the god Mitras was always represented encircled by a serpent. In Java, when Sir Stamford Raffles visited it, he found ancient temples in ruins adorned with serpent images. In Abyssinia, the first king was said to have been a serpent; and the worship of this reptile prevailed until the Abyssinians were converted to Christianity. In ancient Britain our ancestors held the serpent in peculiar reverence. Several obelisks, indeed, still remain in the neighbourhood of Aberdeen, Dundee, and Perth, on which the serpent is a

* Tennent's *Ceylon*, vol. ii., p. 459.

† See his *Personal Narration*, c. 26.

‡ Diodorus Siculus, Lib. ii., s. 70.

frequent hieroglyph. As for Ireland, the celebrated legend of St. Patrick, viz., that he banished all the snakes from it, can only be reasonably explained by the supposition that, in evangelizing that country, he abolished serpent worship.

But it is in India that the most precise and singular forms of serpent mythology are preserved. It is not merely that houses are built for and dedicated to them, in which they are religiously fed and tended with the greatest reverence, or that the cave of Elephanta and other temples are sculptured with gods grasping serpents in their hands. Over and above this more ordinary form of serpent worship, we find distinct mythological representations, so closely copied from the Hebrew tradition, that it is impossible not to recognize their likeness. Maurice, for example, in his large work on the History of India, vol. ii., gives engravings of Krishna, first, as enfolded by a serpent, which is *biting his heel*; and, secondly, as *trampling the serpent upon its head*, copied accurately from the Hindu originals.

Now America supplies exact analogies to all these facts. When Mexico was first discovered, Montezuma, on one occasion, showed Cortez his gods. Among these, one idol was covered with gold and jewels, and his body bound with golden serpents. Some years since, in a collection of Mexican antiquities brought over to England by a Mr. Bullock, the cast of a terrific idol was exhibited, consisting of a serpent coiled up in an irritated position, with jaws extended, and in the act of gorging a woman. Like the Hindus, they also kept live serpents as household gods in their private dwellings.

Nor is this all, for among the paintings of the Aztecs found in Mexico, two have been preserved by M. Aglio in which a figure is drawn *smiting a great serpent on the head*. While a similar but more expressive painting occurs in Plate 74 of the Borgian collection, where a figure is represented as victoriously *smiting the serpent's head*, at the same time that the serpent is *biting his heel*.

I will not enlarge upon this part of my subject by adducing evidences from ancient Peru, and the modern tribes of North America, because I submit that the foregoing are sufficient; for they not only set forth a unity of mythological worship between the Old and the New World, but of tradition also, and that in such exact agreement with the Hebrew tradition as to render their identity of origin approximately clear and certain.

V. The same thing may be traced even still more powerfully in relation to the Hebrew tradition of the universal deluge.

To narrate the many traditions which exist of a general

deluge would be to wellnigh fill a volume. Some of these, no doubt, refer only to local inundations. Others bear evidence, however, by their striking analogies with the Hebrew tradition, that they were derived in some way or other from that source. It is not that any single tradition carries with it all the singular features found in the history of Noah's ark, but that one feature of the history is found in one tradition, and one in another; so that, like the fossil bones of some extinct mastodon discovered in different parts of the same mountain, we can put them all together and reconstruct the original skeleton. Among the Old World traditions, for example, those of Greece, Scandinavia, India, and China preserve the distinct recollection of a general deluge on account of the world's wickedness, and of a *new stock* springing from the number saved. In the Greek story of Deucalion, and the Hindu Matsya Avatar of Vishnu, as well as in the bardic verses of the British Druids, the fact of *remarkable piety* in the saved family is preserved. Among the Hindus and Fiji islanders, the identical number of *eight* saved persons is chronicled. Lucian* relates of Deucalion's deluge that the vessel which saved him took in by *couples* all kinds of living creatures. Plutarch,† in relating the story, adds that Deucalion *sent a dove* out of the vessel. Abydenus,‡ when relating the Chaldean tradition of Xisithrus, says, "On the third day after the waters abated, he *sent out birds*, to try if the water was gone off, but they, having nowhere to rest, returned to Xisithrus. In the same manner did others. And again the third time, when their wings were *daubed with mud*."§ The story of Satyaurata, in Matsya Avatar, says that he entered a large vessel, accompanied by seven saints, and encircled by *pairs of brute animals*, with seeds and medicinal herbs.

Now the argument I urge is that America supplies us with exactly the same sort of traditions respecting a universal deluge. In Peru, the tradition is that the saved persons found shelter, not in a ship, but on the top of a mountain; a fact which, if it stood alone, would simply indicate the recollection of some local flood. This is rendered very improbable, however, by the circumstance of other details being mingled with the story, which are plainly corrupted from the Hebrew tradition. For it is said, "As soon as the *rain ceased*, they sent out two dogs, which *returned to them* smeared with mud and slime. Hence they concluded that the flood had not

* Lucian : *De Deâ Syriâ*.

† Plutarch : *De Solertiâ Animalium*.

‡ Preserved in Eusebius, *De Præp. Evang.* Lib. IX, c. 12.

§ From Sir R. W. Jones's *Asiatic Researches*.

yet subsided. After a certain interval, they sent out *more dogs*, which, *coming back dry*, convinced them that the earth was now habitable. Upon this they left their hiding-places, and became the *progenitors of the present race of men.*"* The tradition found among the natives of the island of Cuba refers the rescue of a man and his family to the friendly aid of a ship, *into which he took many animals*. It states that "when the flood ceased, he sent out a raven, which, because it found food suited to its nature, never returned. He then sent out a pigeon, which soon returned, bearing a branch of the *Hoba tree.*"† Let us now come to Mexico. Humboldt tells us‡ that, of the different nations which inhabited Mexico previous to its discovery by the Spaniards, five had paintings representing the great deluge of Coxcox, or Tezpi. The tradition of one of these was that "Coxcox embarked in a spacious canoe with his wife and children, several animals, and grain. When the Great Spirit ordered the waters to withdraw, Tezpi, or Coxcox, sent out a vulture. This bird did not return on account of the carcasses with which the earth was strewed. He then sent out other birds, one of which, the humming bird, alone returned, holding in its beak a branch with leaves. From another source § we learn that in some of these Mexican pictures the canoe, or raft, is depicted at the foot of a mountain, "while a dove, from the top of a tree, is distributing languages to the men born after the deluge." Scarcely less interesting is the Mandan tradition which Mr. Catlin found when he lived with that tribe on the northern banks of the Mississippi. It was illustrated by a festival kept once a year, and at one of which he was present. This festival was called "The Subsiding of the Flood." Singularly enough, this ceremony "began at a season of the year," says Mr. Catlin, "when the willow leaves are fully out; in allusion to a tradition they have that the twig which the bird brought home was a willow bough, and had full-grown leaves on it. The bird to which they allude is the dove, which they call the medicine bird, and will not allow to be destroyed by any one. The ceremony begins by the sudden entrance into the village of one who personates the first or only man. Descending from the western prairie, he runs into the village, where all stand ready to receive him. His body is chiefly naked, but painted with white clay, so as to resemble at a little distance a white man. During the whole of the day he went through the

* See Faber's *Horæ Mosaicæ*, vol. i., p. 116.

† See Appendix to Norman's *Rambles in Yucatan*.

‡ Humboldt's *Vues des Cordillères*.

§ See Priest's *American Antiquities*.

village, stopping in front of every man's lodge, crying out till the owner asked who he was, and what was the matter. To this he replied by relating the sad catastrophe of the deluge, saying that he was the only person saved from the universal calamity; that he had *landed his big canoe on a high mountain*, where he resided; that he had come to open the medicine lodge, which must receive a present of some edged tools from the owner of every wigwam, that it might be sacrificed to the water. "For," said he, "if this be not done, there will be another flood, as it was with such tools the big canoe was made." Mr. Catlin adds that one of the Mandan doctors gravely told him how the flood was produced—namely, by four tortoises placed at the *four cardinal points*, each pouring forth water for *ten days*—a memorial of the *forty days' rain*, as related in the Hebrew tradition of the deluge, which is singularly confirmatory of all that has been stated before. I might easily increase these evidences. There is a tradition, for instance, among the Algonquin tribes of the Delaware, in which the deluge is described as covering the tops of the highest mountains, while a raft floats safely above them; the point of the story being that Manabozho, the owner of the raft, declares the waters will not subside till he obtains a few grains of earth from the bottom of the deep. Upon this, the beaver first undertakes the mission, but without success; then follows the otter, but with the same result; at last the musk rat plunges in, returning with a few grains of earth in its claws, taking up which, Manabozho dries them in the sun, and scatters them over the waters. This done, the mountains emerge from the deep, and at last the plains and valleys come to view, and the waters disappear.*

It will thus be seen that there is not only a remarkable concurrence even in minute particulars between the Old and New World traditions of the deluge, but that the points of similarity are such as would not have been likely to spring up naturally in the minds of independent nations out of the nature of the case; while, on the other hand, they all conform themselves in some way or other to the history of the Noachic tradition preserved by the Hebrews. This fact, connected with what has gone before, seems to add an almost conclusive argument in favour of the original dispersion of mankind from an Asiatic centre; and in that manner of an organic unity between the native races of America and those of the Old World continents.

* Taken from Squires's *American Archaeological Researches*, where the whole story is narrated.

VI. Let me conclude with a few words upon miscellaneous analogies or affinities. Herodotus gives an account of the custom of scalping among the ancient Scythians, which singularly corresponds with the habits of the North American Indian. The New Zealanders possess a small but powerful weapon for close combat, made of bone or stone, somewhat in the shape of a beaver's tail, sharp and strong enough to split open an enemy's skull, through the end of which, nearest the hand, is a hole for the wrist-cord. Whether a weapon in every way a facsimile of this was likely to have been thought of by an independent race may be open to doubt. It is certain, however, that the ancient Peruvians had exactly the same instrument, even to the hole drilled through the handle and the wrist-cord. Yet, with this exception, no such instrument is found in any part of the world.

The people of Java, according to Sir Stamford Raffles, regulate their markets by a week of five days. So, in ancient Mexico, a month was divided into four weeks of five days each (there being eighteen months in the year); and on the last of these five days there was a public fair or market.*

The Aztecs of ancient Mexico believed also in the past destruction of the world at four successive epochs; so with the Hindus. Among the Mantschu Tartars there are the following signs in the zodiac, viz., the tiger, hare, serpent, monkey, dog, bird. These six signs are also found in the Mexican calendar. There is a singular instrument for striking fire represented in an ancient Mexican painting, in which a man twists a long stick with both hands as it presses upon a flat piece of wood which he keeps firm with his feet. This instrument is exactly the same as that in use among the Malays of Sumatra, and the aborigines of Ceylon. Among the ancient Peruvians, great religious festivals were regulated by the solstices and equinoxes, which were carefully calculated. † So with the Chinese. And just as the Emperor of China, once every year, holds a plough in the presence of his people, to show his respect for agriculture, so with the ancient kings of the Incas. ‡ These Incas, too, like our own Anglo-Saxon race, were in the habit of drinking healths at their feasts; and, like the ancient Persians, they had an elaborate system of government despatches by running posts.

This list might very easily be enlarged; but without any further advantage to our argument; for if the cumulative force of all

* Prescott's *Conquest of Mexico*, B. i. chap. 4.

† Prescott's *Conquest of Peru*, B. i., chap. 5.

‡ Count Carli's *Lettres Americaines*, tom. ii., p. 78.

which has been brought forward does not carry with it conviction, nothing else will. Some persons will probably repel the analogies just named, by urging that they have arisen out of the organic unity of the human mind in different races, without the least reference to a unity of origin in those races. This objection might possibly apply to some points. In ancient Mexico, for example, there has been discovered a piece of pottery with a border pattern painted on it as perfectly Etruscan in its character as if it had been dug up in Etruria itself. The analogy is most striking. Yet the possibility of an independent origin of this sort, in different ages, races, and countries, is so plausible that, taken by itself, it would prove little or nothing. That, and many other analogies, only obtain force by their aggregation with a number of others, too singular and exceptional in the history of mankind to be disregarded—such as those brought forward in the main part of this paper. I now conclude, therefore, with one or two other extraordinary coincidences of the same kind in connection with ancient Mexico—coincidences which have the strongest possible tendency either to prove that America had been visited by Christian missionaries long before the voyages of Columbus, or else that the wave of an Old World migration had taken over thither certain tribes who had previously known something of Christianity. Thus we read, in Prescott's *Conquest of Mexico*, that the Aztecs had a religious ceremony of naming their children, almost exactly corresponding with our sacrament of baptism. The lips and bosom of the infant were sprinkled with water; when God was implored in the following extraordinary language, viz., "that He would permit the holy drops to wash away the sin which had been given to the infant before the foundation of the world, in order that it might be born anew." I merely give you the form of words adduced by Mr. Prescott.

Again, that these Aztecs, with their bloody ritual, should have had such set forms of prayer as the following, is no less extraordinary: "Wilt Thou blot us out, O Lord, for ever?" And, "Impart to us, out of Thy great mercy, Thy gifts, which we are not worthy to receive through our own merits." Once more, what can be more parallel with the New Testament teaching than the following moral maxim: "Keep peace with all; bear injuries with humility; God, who sees, will avenge you." Still more remarkable is the following: "He who looks too curiously on a woman commits adultery with his eyes." In the midst of this strange medley of truly Christian morals with idolatrous abominations, there cropped up also certain vivid evidences of the Roman Catholic

ritual. They administered to each other, for instance, the rites of confession and absolution—the secrets of the confessional being held inviolable, and penances being imposed of the most severe nature. Nor was this unknown to the Incas of Peru, among whom also the conventual system was in full force.

The argument I urge, then, as the result of this paper, is cumulative. First, I have shown that the prehistoric population of America, through oceanic migrations, was possible by five distinct routes. Secondly, I have exhibited strong linguistic affinities between the languages of the Old and New World, rendering this possibility probable. Thirdly, I have adduced a variety of peculiar customs, so original and exceptional as not likely to have been independently thought of, still further confirming this view. Fourthly, I have added to the force of this argument by presenting to view what certainly appear to be distinct mythological recollections of the fall of man, as given in the Holy Scriptures. Fifthly, I have increased the weight of that argument by enumerating specific and minute recollections of Noah's deluge, corresponding too exactly with the Hebrew tradition not to have been borrowed from it. And, sixthly, I have touched upon a few other miscellaneous stores of information, exhibiting certain other analogies of customs between America and the Old World, too curious not to be mentioned. It is for my audience to decide how far the whole chain of evidence, taken together, is worthy of their consideration and respect.

The CHAIRMAN.—I beg leave to propose a vote of thanks to the author of the very admirable paper which has just been read. I am quite sure that we must all feel a great deal of satisfaction at hearing a paper containing such well-arranged evidence against the necessity of supposing or searching for any independent centres of creation. That is a mere theory, and the evidence that has been afforded by the paper of to-night is not only very conclusive and satisfactory, but to my mind offers many points that prove, not only that the origin of various races, in various parts of the globe, sprang from the same identical source, but that their origin is in conformity with the account which is given in the Scriptures. That account has been shown to be highly probable, and indeed much more so than the contrary supposition, which I am sure every one present must feel is very satisfactory. (Hear, hear.) I will only add that if any members have any remarks to make upon the paper which has just been read, I shall be most happy to hear them.

Rev. Dr. THORNTON.—It may seem presumptuous in me to offer any remarks upon so very learned, able, and conclusive a paper as that to which we have just listened, but perhaps I may be allowed to make a few observations

in corroboration of it. As to the preference of the female to the male line, setting aside the eldest son in favour of the sister, and taking as heir the son of the sister, I recollect that there is a statement in Herodotus to the effect that the Lycians had the same practice, and they gave as a reason the somewhat pungent statement that a man might be pretty sure who his mother was, but he could not be quite so sure about his other parent. (Laughter.) It is a fact, which is doubtless very well known to Mr. Titcomb, that the Lycians, of whom we know comparatively little, appear to have been a civilized people. I may also add that the practice of baptism, which Mr. Titcomb mentions as having been prevalent among the Aztecs, was also observed by the natives of New Zealand. The child was taken when eight days old to the priest, who poured water on it that it might live, without which the infant was supposed to be eaten by the Atua demon within a certain time. That is a curious analogy; but I should be inclined to attribute it, not to any Christian tradition, but rather to a tradition connected with the early custom of the Jews in the admission of their proselytes. I should, for the same reason, be inclined to doubt whether Mr. Titcomb is correct in attributing to the Aztecs a medley of Christian morals mixed up with idolatrous abominations and certain vivid resemblances of the Roman Catholic ritual. I should rather attribute those customs to some affinity with the Buddhist ritualism; and there is reason to believe that the strange customs referred to existed among the Buddhists long before they were borrowed by the Roman Catholics. Indeed, there is some reason for thinking that, instead of the Buddhists having borrowed anything from the Roman Catholics, the Roman Catholics got from them some things in their system, as pointed out by Mr. Titcomb; for instance, celibacy, abstinence from flesh, and penance, which have been known to exist for ages among the Buddhists. Any one who has read M. Huc's entertaining account of his visit to the Lamaseries in Mongolia will not be at a loss to see how the Aztec, Roman Catholic, and Buddhist customs may be considered to have a connection one with another. I may perhaps, however, be permitted to say that I think Mr. Titcomb scarcely appreciated sufficiently the fact (in referring to the analogy between the Iberian or Euscaldune language and the languages of North America) that the Euscaldune language probably belongs to the Turanian family, and was also a finished language: in fact, it is not unlikely that the ancient Lycian and the ancient Euscaldune languages were very similar. The agglutinate character, which is very remarkable in all the languages of North America, is found in the Turanian, and to a great extent in the Mantchou language. The monosyllabic form tends to agglutinate, and the number of syllables such as a North American strings together is really more characteristic of the Mantchou than it is of the more finished Turanian. Still the principle is the same, and we can therefore well suppose that the Turanian race did actually cross over at some remote period to the great continent of America, which is still further strengthened by the tradition which was found to exist in Central America that it was peopled by a race who came over in three great canoes. I think that we are very much indebted to Mr. Titcomb, and are bound to give him our hearty thanks for

the three great canons he has laid down in order to guide us when arguing from analogy. It has been well said that a coincidence to a historian is a will-o'-the-wisp, and that it very often leads him into a quagmire. The remark applies with still greater force to reasoning from analogy in philological studies. Nothing is more tempting, and nothing is more delusive to the philologist than a coincidence, and the three great canons laid down by the learned author of the paper are peculiarly valuable to us, as tending to put us on our guard against being led away by the great similarity of the agglutinate principle of the Aryan and the Turanian languages and those of North America, or being deterred, on the other hand, from forming a specific conclusion by the slight similarity which exists between the Semitic languages and the languages of South America; and arguing from analogy that they afford us sufficient proof that there must have been some intercourse between the Old and the New World, or rather that the inference is not only possible, but highly probable, that the population of what we call the New World sprang from some kind of emigration, which took place, whether by accident or design, from the Old World. (Cheers.)

Captain FISHBOURNE.—If I may be allowed to make a remark upon what may be termed the geographical view of the question, I would observe that the origin of currents is generally attributed to the winds; and Mr. Titcomb has not laid any great stress upon the winds, which I think are a much more reasonable and effectual way of accounting for the intercourse taking place between the two continents than any other. It must be remembered that canoes and rafts are very common even in these days on the coast of Chili. Great quantities of goods are carried upon rafts, and when they are blown off from the land, what can be more likely than that they should be carried away with the prevailing winds? The trade-winds blow exactly in the direction of the two courses which Mr. Titcomb has referred to. The north-east trade-wind would carry them from Polynesia, by the Pacific, over to America; and the south-east trade might carry them round the Cape and across the South Atlantic. With respect to the improbability of small vessels making such voyages, which has sometimes been alleged, it must be remembered that the old voyagers made some of their voyages in very small vessels. We have in these days got such large ships that we can hardly imagine that such voyages as those we are talking of could have been made by small vessels; but in the days of Anson we had vessels of from only 30 to 70 tons making long sea voyages; whereas now that we have ships of from 3,000 to 4,000 tons, we really begin to imagine that it is impossible to make a long voyage in a small vessel, and so that when we hear of people coming over from America in a small boat in which there were only two men and a boy, it is considered a most extraordinary thing, and all the world rushes to see the vessel. There really is nothing extraordinary in it; for voyages equally remarkable used to be made quite commonly in those days. I recollect, some years ago, Wilson Croker justifying his promotion of a son to a command at an early age, by saying that nobody had heard of such a feat of seamanship as he had achieved, for he had actually navigated a vessel

of 200 tons round Cape Horn. Why, if you carry yourself back a hundred years earlier, you will find that Cook, Frobisher, and other naval commanders made the voyage in much smaller ships. I merely mention this in order that no currency should be given to the idea that it was impossible for the thing to have occurred in the way suggested by Mr. Titcomb.

MR. SHAW.—It is with some diffidence that I venture to make one or two remarks on the views of the rev. gentleman who has read so very able a paper; but I must confess, in the first place, I am somewhat surprised at the very slight regard which Mr. Titcomb seems to have paid to that means of communication which I have always thought the most likely to have been the medium of conveying the population of the Old World to the New—I mean the communication by way of Behring's Straits; and although I feel, with the gentleman who has just spoken, that the winds and currents have probably had a great deal to do with any accidental transmission of people from the Old to the New World, still I think that, having regard to the fact that Behring's Straits are only about 45 English miles across, that they are centred by two large islands, and that very often in a severe winter the waters are frozen over, thus forming a complete and unbroken means of transit on foot, it may undoubtedly be taken as one of the most probable means of the transmission of the human race from one world, or rather from one part of the world, to another. Again, I think, although I would not enforce it as a necessity, that a little stronger tone might have been used with regard to the accidental transmission of mankind from Asia to America by means of the equatorial currents or the wind currents, whatever they may be. With regard to the use of small boats, such as the one alluded to by the gentleman who spoke last, namely, the boat which came over recently from America to this country with only two men and a boy, although that may show clearly enough that very long voyages may be made in very small boats, it must be remembered that in order to support the proposition that America was peopled by individuals who were drifted there by currents, you must show that they must have set out for the very purpose of peopling a new country, since it is quite evident that any individual who was thus drawn into the current or trade wind must have had his wife with him, which is rather against the supposition of America having been accidentally peopled in this way. I don't think that that is quite consistent with an accidental transit by means of rafts or small boats. Of course if there was a determination to go forth upon some voyage of discovery for the purpose of peopling a new land, the men who went would be prepared with that necessary means of increasing or keeping up the population. What has been said by the learned author of the paper with respect to the traditions of Mexico appear to me to be most remarkable, and to afford as strong a reason as any why one should believe that the notions of the Old World have been carried to the New. The very great similarity between some of the traditions of the Mexicans and those of the Jews, the pyramidal column, and the notions of the deluge, which have certainly been current in Mexico for ages, go a long way to make one think that at one time or other there must have been distinct and positive, and

lthough a little misty and confused, yet still direct evidence of the circumstances mentioned in the account of the Noachian Deluge. But, in speaking of these customs, or beliefs, or traditions, or whatever you like to call them, among the Mexicans, one circumstance has occurred to my mind which affords a reason that I think is almost conclusive against the supposition that the New World was peopled by any people who were conveyed thither direct from the heart of Asia, and that is, that the old Indians never thought it necessary to invoke what they termed the Great Spirit in aid of good works; they believed that Spirit to be always ready and willing to act for good, and therefore that it was not necessary to propitiate Him or to pray to Him in support of anything which they considered to be good. Their custom, therefore, was to endeavour to propitiate the bad or evil spirit, to engage his good offices in behalf of good works. It is a very singular thing that, while men in all Christian countries should address prayers to the Good Spirit, praying Him to countenance and help them in all good works, they should in America have taken the directly opposite course, and, leaving the Good Spirit, should have addressed all their prayers and aspirations to the evil one, and should intercede with him not to hinder them in their good works. The paper as a whole tends, in my mind, very much to confirm the *littera scripta* of Holy Writ; and anything which in the way of scientific investigation tends to confirm that must be truly gratifying to inquiring minds. It is so much the fashion nowadays to obscure with uncertainties the plain words of Holy Writ that if we, by ingenuity of thought and consideration, can prove that science is not incompatible with the exact words of Scripture, it must be a cheering circumstance to the mind of inquirers. I cannot help feeling that such a paper as we have heard read is very acceptable, because nothing in the world can be plainer than the 19th verse of the 9th chapter of Genesis, in which it is said that the three sons of Noah were Shem, Ham, and Japhet, and that from them the whole earth was overspread. (Hear, hear.)

Professor MACDONALD.—I cannot help, in this society, expressing my opinion that the existence of different characteristics in the various races of mankind is not quite consistent either with the ideas of the writer of the paper or of the gentleman who has just sat down. That gentleman has referred to the account in the book of Genesis where it is stated that the whole earth was peopled by the three sons of Noah. Now I think that if clergymen and others were to read the whole of the passage from the commencement of Genesis, they would be of opinion that there was a very different system of distributing the people throughout the world. It has been too much the fashion to accept the interpretation which has been placed by the clergy upon the books in the Scriptures, which give an account of the distribution of mankind amongst the different nations of the earth. It must be remembered that for a very long period of time the Scriptures were thought to be the sole property of, and that the right to explain them was entirely in the hands of, the Church, and therefore any attempt, by the aid of science, to explain them beyond the exact teaching of the Church was looked upon as heretical and wrong. Now, I think that

if you read with strict faith in the Holy Scriptures the 1st chapter of Genesis you will come to a very different conclusion with respect to the distribution of mankind. In point of fact, it would be forced upon you. It has been too much the habit to doubt the wonderful declarations of the 1st chapter of Genesis, from its not coinciding with our ideas that any portion of the human kind should have been created subsequently, and therefore the subsequent myths and fancies of the people are preferred to the true interpretation and true use of the Scriptures. But the 1st chapter of Genesis has the same high inspiration that all the rest has, and my object in wishing to direct attention to this point is, that mankind are there described to have been created the day previous, whatever length of time you may take that expression to mean, whether it was a period of ages or a period of days, a period of weeks, or even of seconds. However long or however short it may be, it was a different period; and it was anterior to the creation of Adam, who, we have been told to-night, and who is generally believed to have been the great source and father of the human race. Now, I believe nothing of the kind. In my opinion Adam and his paradise is comparatively a modern creation——

Mr. REDDIE.—The learned professor will forgive me interrupting him; but I am afraid that he is travelling into a subject which is a great deal wider than the scope of the paper which has been read, and I doubt whether it is desirable to drift away from the discussion of so admirable a paper by introducing a still larger subject.

Professor MACDONALD.—If Mr. Reddie happened to know what I was about to say, he would be a better judge as to whether it had a bearing on the question or not; but, as he does not, I must be pardoned for proceeding to explain my views. What I start with is, that the world was peopled on a day anterior to the paradisaic age, and that the blessing of God was then bestowed on them. We are told, in the 27th and 28th verses of the 1st chapter of Genesis, "So God created man in His own image, in the image of God created He him; male and female created He them. And God blessed them." This, I contend, was before the paradisaic age. God created them with full liberty of everything. They were to have dominion over the fish of the sea, the fowl of the air, the beasts of the field, over every living thing, over every herb and tree; everything was given to them. There was no restriction whatever as to the eating of the forbidden fruit; that is entirely a restriction which relates to the sabbathic Adam. I bring these observations to bear on the notice on the paper by observing that the gentleman who followed the writer of the paper showed that the Turanian was probably the most extensive source of the language of America; but what are the people? What are the yellow races of mankind? They are scattered all over the world. There is a great mass of them in China; but generally speaking they are a maritime people. You have them scattered all along the edges of the southern continent. You have the Fins, and the Laps, and the Esquimaux scattered all over the coast of the north hemisphere. That I consider is a

proof that the world was peopled from different centres, which became scattered in different places; and from which I conceive the varied races of mankind to have descended. But the principal object which I had in view in rising was to direct your attention to the fact that it is generally considered that the source of the human family was created in a comparatively recent age; whereas it appears to me, from a study of the 1st chapter of Genesis, that the whole earth was peopled at a much earlier period than the Adamic age, and that it was peopled in different centres. I do not mean to say that the population was entirely spread over it, but that there were different centres of the human family; and it is particularly observable that in the tropical regions we have black races of wholly different kinds. I cannot and will not believe that they could possibly have come from the same stock. There must have been different individual stocks. I am pleased with the paper; it is on a subject into the details of which we cannot enter without due caution and anxious study; but I would suggest, from the considerations which I have now thrown out, whether it is not probable that there was a much earlier state of creation, so far as concerns mankind, than what is usually believed. I view the creation of Adam, as the creation of one source of a human family alone. The object of this creation was restrictive: their penalties were greater, and those penalties were entirely restricted to them; but, for fear I should call up Mr. Reddie again, I will simply say that the consideration of the subject of the age at which mankind was created must, I think, lead us to the conclusion that the period must be antedated in reference to the period of the creation of the paradisaic Adam.

MR. REDDIE.—I cannot help thinking that the learned professor has failed to appreciate the issue which is raised in the paper under discussion. Unquestionably Mr. Titcomb was not likely to be ignorant of the fact that there exists what has been termed a pre-Adamite theory of the creation of mankind, and that one portion of that theory is that the human species sprang not from one common father of us all, but from various centres of creation; because the whole object and tendency of the paper is to prove that that pre-Adamite theory is not so probable as the other theory that all mankind has sprung from one common origin. It was not intended to-night to discuss the Scriptural argument or the Scriptural view of the creation of man, but, simply taking the facts as we have them, of the existence of black races, white races, yellow races, and red races, to show, by pointing to a community of customs and to a community of language, and by proving the existence of opportunities of migration, that mankind, as now spread over all the world, with all these various diversities, may (as we have been recently taught in very learned quarters on physiological grounds) still have been developed from a single pair; and that the facts as we find them are not at all incompatible with the account of the origin of mankind as described in the Scriptures. Mr. Titcomb's object was to show from all these various arguments what is the most probable belief as regards the distribution of the human family, and therefore I think that we cannot to-night enter into any mere exegesis of the

1st chapter of Genesis, or properly go into any of the various arguments of a different kind which might on another occasion have been adduced as regards the probable diversity of the human race in its origin. I hold in my hand a paper read by Sir J. Lubbock, in the Ethnological Society, on the 26th of November last, which has also been put forward by him in a lecture delivered at University College, London, on the savage origin of mankind. Now Sir J. Lubbock is a Darwinian, and yet he is quite aware that there exists that great diversity in mankind to which Professor Macdonald has alluded, and of which Mr. Titcomb is so well aware that he has written a paper to show that there has been probably a common origin of mankind instead of its having sprung from different centres of creation. In that paper Sir J. Lubbock refers to some customs which I will very briefly glance at for the purpose of proving or at least confirming Mr. Titcomb's argument, notwithstanding that Sir J. Lubbock holds the opposite doctrine, and adduces those customs in proof of his own views. He considers that mankind rose from a savage condition, and not from a common civilized ancestor, such as we believe the first man created by God to have been. In reference to the peculiarity of kinship which has been noticed this evening, he says,—

“We recognize kinship running through a family line, and the traces which exist, running through the Australians, the Fijians, the South Sea Islanders, and the Cossack hordes, &c., may unquestionably dispose the mind to believe that mankind sprung from one common origin, and were afterwards dispersed all over the world.”

Now that is a very fair admission to be made by Sir J. Lubbock, who takes the opposite view ; and he goes on to say that there is some additional reason for this supposition in the universality of the custom which has been found to exist in so many nations of a man's heirs not being his own children, but those of his sister ; the mode in which the inheritance goes constituting the family line. There is another custom to which he refers which was brought prominently forward by the late eminent Judge Haliburton, the well-known author of “Sam Slick,” in a paper which he read before the Institute of Natural Science, in Nova Scotia ; and it is curious that the learned judge rested almost the whole of his argument on one particular custom which is common to almost all nations, but to which the author of the present paper has not alluded ; so that I think it will be useful now to refer to it. The title of Judge Haliburton's paper is, “The Unity of the Human Race proved by the Universality of Certain Superstitions Connected with Sneezing.” As you are quite aware, no doubt, it is the custom in many countries to say when a person sneezes, “God bless you,” or to use some other equivalent expression. That is a custom which Sir J. Lubbock admits to be at first sight both odd and arbitrary, but, so far from being confined to one nation, it has been found to extend over a great part of the world, and has even been found to exist in Otaheite. Sir J. Lubbock, however, contends that the custom is not arbitrary, because Judge Haliburton admits that to sneeze is considered an omen of impending evil. Now I consider that is a very arbitrary interpreta-

tion of sneezing, for not one of us, for instance, believes anything of the kind ; and indeed most of us rather enjoy a good sneeze very heartily. But the reason why Sir J. Lubbock has joined issue on the point whether the custom is an arbitrary one or not is because a community of arbitrary customs is the best proof of a common origin or unity ; and he goes on to say that the deduction that two and two make four, or that twelve months make a year, which we arrive at naturally, is no proof of a common origin. But, in making that remark, the learned baronet has fallen into a strange mistake. Most certainly such a division of the year into twelve months is purely arbitrary, for naturally the division would be into thirteen months, from the thirteen moons that occur in the year. There are several other arbitrary customs mentioned in the paper of Sir J. Lubbock to which I have alluded, but which I do not think by any means so exhaustive as the one we have just had the pleasure of listening to. The most important of all these arbitrary customs is one which has only been slightly glanced at by Mr. Titcomb, but still sufficiently to show that he has not overlooked the point, and that is the division of the sky into "constellations" of stars. I hope one day that we shall have some able author to take up that subject, so as to show a community of thought and object in dividing the starry sky into those very arbitrary signs designated by arbitrary figures and animals of various kinds, which seems to me to be a thing which could never have occurred independently to different peoples. It is a fact that the tendency of the present day has been to try to reverse that custom, though it is found that throughout the whole world, wherever there is the least knowledge of astronomy retained, you have the signs of the zodiac pretty nearly as we have them on the celestial globe. But the original divisions seem to have faded most completely and extensively in America, although, as has been mentioned by Mr. Titcomb, even there they have been retained in some few instances. Before I sit down, and with reference to the remark made regarding the mode of interpreting the Scriptures, I am going to take the liberty of criticising the paper on one point, and one only. There is no doubt whatever that what has been supposed to be the teaching of the Scriptures has much more frequently been the teaching merely of the belief of the people into whose hands the Scriptures have fallen, and who have been the generally accepted teachers of the day, and of course at certain different stages in the history of Christendom. Substantially, no doubt, Professor Macdonald is quite right in saying that the clergy were once the sole interpreters of the Scriptures. But it is unnecessary to tell him that then the clergy were the only "clerks" or learned people, and that they alone taught science and everything else. They naturally had their science drawn from such sources as they could get, but when they had once got a notion which they thought to be science they very often found it in the Scriptures also, just as Professor Macdonald has found the theory of the pre-Adamite men there ! The only two or three words of the paper to which I am going to take a slight exception—and I am sure Mr. Titcomb will excuse me, and will agree with me when I have explained what I mean—are those which referred to the belief respecting the shape of

the world in the middle ages. He says that the discovery of Columbus was discredited because up to that moment science and Scripture had alike been made to teach that the world was round like a plate. Taking the words as they stand in the sentence, there is no kind of objection to them, but I merely wish to show that the interpretation which was then placed upon the Scriptures must have been an erroneous one, because there is not a single passage in the whole of the Scriptures that supports the opinion that the world is round like a plate. On the contrary, I think passages may be found in the book of Job which clearly prove a knowledge of the rotundity of the earth. (Hear, hear.)

MR. E. R. PARRISON, F.G.S.—I beg leave to make a few remarks, and I will commence by stating that it appears to me that the proposition of Professor Macdonald is very material to the consideration of the question before us ; so material, indeed, that if it were proved it must overthrow the theory put forward by Mr. Titcomb, since they could not both be true. What is Mr. Titcomb's theory ? It is of a definite character, and if, therefore, we are to pass judgment upon it in reference to the facts which he has produced, the one proposition is necessarily thoroughly antagonistic to the other. With the exception of Professor Macdonald, all the speakers have been engaged in adding stones to the noble cairn which Mr. Titcomb has raised. The paper which Mr. Titcomb has read is an admirable one, and as worthy of the attention of a learned society as any that has been read in this room, but we must not, of course, presume that it disposes conclusively and for ever of the whole question, and leaves nothing whatever to be said by those who take a different view. I therefore think that it is well that Professor Macdonald should state honestly and independently his views, in order to enable us to consider in what point of view the paper requires discussion this evening, and what must be the tendency and direction of the discussion. The title of the paper is, I think, amply justified by its contents. It takes the case of a people who, in regard to this subject of the dispersion of the human race all over the world, may be termed an *experimentum crucis* on the question ; for surely if there are any men to be found in the world who have not a common origin with the rest of mankind they would be found in America, because it must become apparent to any inquirer that, so far as intercourse is concerned, there must have been much less intercourse between Asia and America than between Asia and any other part of the known world. I say, therefore, that if any one thinks he can trace an independent origin, where is it more likely that traces of such an independent origin could be found preserved than in America ? But Mr. Titcomb has, I think, shown that not only do no such traces of independent origin exist, but that, on the contrary, there are distinct traces not only in analogical resemblances in language and customs to the old world which were found to exist on the discovery of America among the Aztecs and other nations, but he has also shown that there were certain possible modes by which the intercourse could have taken place. The only question with me is how far those proofs can be carried. Mr. Titcomb has adduced what I may call the geographical argu-

ment to prove not only that intercourse between the Old World and the New was possible, but that it did actually take place. Now I think I can carry that argument still further, and I hope you will not be suspicious of me when I seek to bring a proof from certain suspicious quarters in the estimation of some, namely, that mixture of archæology and geology which belongs to the flint period, and to the period which immediately succeeds it. We have now obtained a very large collection of relics from the lake dwellings, such as hammers and other implements used by our remote ancestors. This epoch is also well illustrated by the remains of animals which have been found, and especially by the bones of the reindeer and the implements made out of them, and which have been found without any admixture, so that such collections constitute a particular group of remains, which may be witnessed at Neufchâtel, and there is also a still larger and more complete museum of such things in Victoria-street, and which will illustrate the archæology of this remote period. We have thus had an opportunity of examining almost all the implements used, for it is quite evident that they all were used in these lake villages, and the materials are all admirably disposed and classified; and the conclusion to which we must come is that they were the relics of a people of quasi-civilized character. (Hear.) They were certainly civilized to the extent which the Esquimaux may be termed so, and if you have any doubt as to their being a civilized people all you have to do is to visit the museum of Mr. Christie, and there you will find harpoons of bone and materials used in fishing, such as forks, also harrows, diggers, and cutting instruments, such as scythes. With all this in your mind, if you compare the archæological implements with those now used by the Esquimaux and Fins, you will find that they are almost identical—many of them certainly are, so far as their forms and the uses to which they were applied—with those of the present day. Then I go further than that. If you look at the skulls, although one does not attach much importance to the measurement of a skull, yet you do get a certain idea of character from the skeletons. If, then, you can get an idea of the skeleton of the people, so as to form an idea, as to their stature and appearance, of the skeletons of Fins and Esquimaux, you will come to the conclusion, which is remarkably strengthened by what we have heard, that the inhabitants of Sicily, the South of France, and especially of Ireland, are identical with the people who have been for ages inhabiting the northern shores of North America. Whether they were driven northward in consequence of a change of climate, or by some other cause, is not material to Mr. Titcomb's purpose; all that is necessary for him to show is that they are the same identical people, so far as we have evidence bearing on the question, and we have no evidence to the contrary, so that Mr. Titcomb very likely added this to the cogent chain of reasoning on the geographical ground, in order to show that not only did some intercourse take place between Asia and North America, but that traces can be shown which would go far to prove that a much more direct means of intercourse with America might have been found from India. Then we come to the analogy which we find between the language of the Old and the New World.

I hardly know whether it is necessary to make any observations on that point, because the question of language is a very large one indeed, and, so far as it has been touched upon this evening, I do not think that anything has been advanced which is conclusive against Mr. Titcomb's argument of a common language ; on the contrary, there are proofs at any rate that in some respects the language of remote nations is alike, and therefore so far a proof of their common origin. Then, in regard to social habits and customs, there is a very curious instance which occurs to me, and which will be found described in Foster's voyages. On his last voyage he found that one of the tokens of grief among the Californian people and in Vancouver's Island was the chopping off of one joint of the little finger of the left hand, and he found also that the same custom prevailed among one of the largest tribes of the Hottentots, among whom chopping off the first joint of the little finger of the left hand was not only considered a mark of mourning, but of honour ; and in point of fact they exhibited their finger with the joint chopped off just as a man might exhibit one on which he wore a mourning ring as a token of grief. I suppose it will be said that this is a mere arbitrary custom——

Mr. REDDIE.—Merely arbitrary, according to the view of Sir J. Lubbock.

Mr. PATTISON.—Well, it is quite as arbitrary as any of those which have been mentioned ; but I think Mr. Titcomb's theory is right, that it could not have sprung from the mere sense of the people, or from any supernatural communication (hear, hear), but from some mode of intercommunication ; and that is further strengthened when we reflect that some of the customs mentioned have a ritualistic bearing. I will not trespass further on your time. I was glad to hear the accumulative arguments of Mr. Titcomb, because it is only in that way, by the accumulation of obscure items, that we can come to a reasonable conclusion. I think that a reasonable conclusion has been come to, and that a larger study of the subject would tend still more to prove it. To my mind one of the best proofs of the extreme naturalness and probability of the Scriptural account of the dispersion of mankind is to be found in the fact of the enormous exercise of ingenuity to which men are put in order to account for it in any other way.

Rev. W. MITCHELL.—I will just make one observation upon a paper which is so very valuable, and which has met with such very general acceptance. I may say that I can hardly conceive why, except for the purpose of drawing our attention to what may be considered an unorthodox view of the question, Professor Macdonald has introduced his system of pre-Adamitic men. I think that the answer to such a theory is contained in the paper itself, and in the arguments which have been brought forward to prove the original unity of mankind, dispersed throughout the earth. And I take my stand on the high ground of Biblical interpretation. Men in all ages, since the Bible has been looked upon as the book of God's revelation, have universally adopted one view in regard to the interpretation of that book, namely, that the whole human race sprang from one common ancestor ; that that ancestor of the human race fell ; that the human race multiplied, and became exceedingly wicked ; that the whole race was destroyed, with the

exception of a single family, and that that destruction was caused by the flood; and I think that the accumulative evidence brought forward by Mr. Titcomb is in accordance with that opinion. He has not only shown that, in all probability, the large continent of Asia was peopled by a race which descended from Adam, but he has shown also, by a large variety of strange customs among mankind in different parts of the world, that not only have the race descended from Adam, but that they have retained, on the whole, considering the wonderful change in the surrounding conditions to which they have been exposed, an extraordinary unity and community of feelings and customs. I was very pleased to hear Mr. Titcomb refer to the labours of Mr. Catlin among the North American Indians. Had it not been for the self-devotion of that man, and the manner in which he laid himself out to preserve the perishing records of a perishing race, we should have known very little of the traditions of the North American Indians. He particularly refers to the tradition among the Mandan tribes. Now, that tradition, as Mr. Titcomb has clearly pointed out, is not simply a tradition of the Mandan tribes alone, but is to be found among other tribes of North American Indians, and also in a mitigated form amongst the more central nations of South America, in Peru and Mexico. One very curious fact which Mr. Catlin mentions with regard to the Mandan tribes throws considerable light on the arguments Mr. Titcomb used to show how America might have been peopled. He says that among the Mandans he found a tribe having a peculiarity of customs, a peculiarity of language, and a peculiarity of appearance which distinguished them from every other tribe of Indians which he had met with in North America. He found there was a prevalence among those Mandans of light-haired men, whose physiognomy and physique were essentially different from the rest of the North American Indians. Now that tribe became completely extinct before Mr. Catlin made his second voyage. It was entirely destroyed by the smallpox; and its records which were accumulated by Mr. Catlin are the only relics of a tribe which has entirely disappeared from the surface of the globe. On account of his knowledge of medicine, and of the success attending his efforts to eradicate disease from among these tribes, Mr. Catlin was looked upon by them as a great medicine-man, possessed of considerable power, and in consequence was able to get admission into their tents, and saw some of their sacred rites, which he would not have been permitted to view as a mere stranger; and he throws out an hypothesis which is one of considerable probability, namely, that the tradition being that a Welsh prince, Madoc, having been driven by contrary winds across the ocean, and at last cast upon the shores of Mexico, the Welsh people who formed his crew amalgamated with this particular tribe, and introduced customs among them which were not common among other tribes. For instance, he mentions that the pottery of the Mandans was far superior to the pottery of any other tribe; that there was a great improvement in it, but that the people who improved it partly died out, leaving, however, traces of their ancestors in the light-haired race which appeared in their tribe, contrary

to the usual characteristics of all other North American tribes. That would show how, if anything could show it, a peculiarity or difference might arise in a single tribe ; and it also shows that the fact of a shipwreck, such as that mentioned in the paper of the Japanese shipwreck, was not an isolated case in America, but the tribes may have been told by those people, "We come from a superior source of civilization." The same thing exists in the Mexican tradition that men and women, children of the sun, came among them at some remote time, and they attributed their higher degree of civilization to the civilization that was introduced among them by the people. The Peruvians also had a tradition of that kind, all of which, in my opinion, tends to prove the hypothesis contended for in the paper. Perhaps the best way in which to test the accuracy of the paper would be to try it on the other hypothesis, how could such an accumulation of arbitrary things exist among the inhabitants of all these countries without supposing them to have had a common origin ?

MR. WARINGTON.—I wish just to call attention to one item of Mexican tradition which seems to have been overlooked by the learned author of the paper. I cannot remember the exact details, but I can only give him the source from which I learnt it, which is Tylor's *Researches into the Early History of Mankind*. In that book the author mentions a Mexican tradition which points to some part of the Mexican race having once inhabited the Arctic regions. If so, that is a very important element in the idea of America having been peopled through Behring's Straits. As that idea has been so fully referred to in the course of the discussion, and as Mr. Titcomb seems to have thought somewhat slightly of it, I think it right to draw attention to this fact which is stated in Mr. Tylor's book.

REV. J. H. TITCOMB.—I will not detain you at any great length in reply. I will only say, in regard to one or two remarks about the things which I have omitted, that if I had not omitted many things in my paper I should have been talking now. I am not unaware of the tradition referred to in Mr. Tylor's book, and, in point of fact, if you refer to the footnote at the bottom of page 11 of the printed paper,* you will see that I have made a reference to Mr. Tylor's book ; indeed some of the customs I have mentioned I have taken very much from that book. Mr. Shaw, in the remarks he has been good enough to favour us with, has spoken of the improbability of any persons who were sailing in boats being driven by the force of the currents or winds over to America, and their having peopled it, because it was not likely that they would have their wives in their boats with them. That is one aspect of the question ; but on the theory that persons who were in boats on an excursion might have been blown off the land, or been caught in one of the currents to which I have alluded, such an idea might become possible. When I told you that it was discovered some time since that one of the headlands in the Hawaiian group had a name attached to it by the natives which signified the starting-place for Tahiti, that seemed to indicate that

* *Ante*, p. 294.

the idea of long voyages was not absolutely unknown to them. Those voyages would be more or less for business, but why not for pleasure? I can well conceive that upon a pleasure excursion in a canoe men and women might travel together. And if one of those canoes got caught in the Antarctic drift, then, as I have pointed out, it might easily happen that the people in her would find themselves on the coast of Chili or Peru. With respect to what Professor Macdonald has said, I was not, of course, unprepared to receive such remarks, but I think they have been completely answered. Of course I could not be supposed to be ignorant of the pre-Adamite theory which Professor Macdonald has referred to. All I can say is, that I have thoroughly investigated it, and that I disbelieve it as strongly as he can believe it. I disbelieve it, not merely as a clergyman, but as a man of impartial judgment and extensive reading in this particular branch of study. However, the learned professor must be aware that in the remarks with which he favoured us upon this point he scarcely urged it upon us by force of argument, but merely stated his convictions upon it—

Professor MACDONALD.—I was unable to do so in consequence of Mr. Reddie's interruption.

Rev. J. H. TITCOMB.—I quite agree that you had no opportunity of entering into so wide an argument; but I think that as the tendency of my paper is to show that the world was peopled from Adam, or rather from Noah, and therefore *à fortiori* from Adam, it does more or less meet the arguments which the learned professor would raise against it. Ladies and gentlemen, I need detain you no longer. I was fully aware of the sneezing argument, and others which have not been brought forward. In reference to what Mr. Pattison has said, I feel much obliged to him for calling my attention to one point which is rather new to me; but on the whole I can only say that the great crucial difficulty is the physiological one with regard to colour—how it comes that red men crop up in America, yellow men in China, black men in Africa, and white men in Europe. I quite admit that that is the great point of the argument in favour of Professor Macdonald's theory of pre-Adamite men. But I purposely avoided going into it, and for this reason, that it would be utterly impossible to deal within the limits of a paper which has necessarily already extended to great length, with a question which involves many materials and such important details; but I do hope at some future time to write a paper which may perhaps go into the subject in such a manner as will enable us to discuss it. (Cheers.)

The meeting was then adjourned.

ANNUAL GENERAL MEETING, MONDAY, MAY 25, 1868.

CHARLES BROOKE, ESQ., M.A., M.B., F.R.S., VICE-PRESIDENT,
IN THE CHAIR.

The Secretary read the Second Annual Report of Council, which is as follows :—

SECOND ANNUAL REPORT of the Council of the VICTORIA INSTITUTE, OR PHILOSOPHICAL SOCIETY OF GREAT BRITAIN.

Progress of the Society.

1. The COUNCIL regret that they are unable, in this their Second Annual Report, to congratulate the Members and Associates of the VICTORIA INSTITUTE upon an accession of numbers during the past year, like that which it was their pleasing duty to announce at the First Annual Meeting of the Society a year ago. They regret this the more, because the work already done by the Institute has been unusually great for a new society to accomplish; and the importance of the Papers read at our Meetings and published, with the discussions thereon, has been generally acknowledged by such portions of the Press as give attention to the issues that unfortunately have been raised between the Holy Scriptures and certain theories in science. At the same time this marked success of the Institute, in all that regards its most essential work, affords us some consolation, and is a matter for sincere congratulation to all who have helped in so good a cause, whether as Subscribers to our funds, as Patrons,

Members, or Associates, or more actively, besides, as Contributors to our *Journal of Transactions*. And those who have sympathized with our objects, and seen with satisfaction our success, without as yet joining our ranks, must remember, that without our organization and our subscriptions, what has thus been done must have been left undone; and, that we have rather gone beyond our present means in the amount of printed matter we have already published; so that all who desire to see our work merely continue as it has begun—to say nothing of our attempting to accomplish any of the further aims of the Institute—should keep in mind that this must entirely depend upon the increase of our Subscribers.

2. The number of Members and Associates for 1867, as estimated in last Annual Report, was 283; of whom 18 were Vice-Patrons and Life Subscribers, leaving 265 Annual Subscribers on 1st May, 1867. This estimated number for the year 1867 must now be corrected as follows:—

	<i>Life.</i>	<i>Annual.</i>
Totals	18	265
<i>Abate</i> —withdrawn or deceased, &c., 1867	...	23
	<hr/> 18	<hr/> 242
<i>Add</i> —enrolled between 1st May and 31st Dec., 1867	2	22
	<hr/> 20	<hr/> 264
Actual Numbers for the year 1867 ...	<hr/>	
Total	284	

Of the above number of 284, however, the subscriptions of 49 Members are in arrear, but expected to be paid; and the subscriptions of 11 Members are still due for 1866.

3. The total number of Members and Associates enrolled to 1st May, 1867, was, by last Report ...	291
In the year up to 1st May, 1868, the additional Members and Associates enrolled were—	33
	<hr/>
Making the total to 1st May, 1868	324

Finance.

4. The Balance-sheet of the TREASURER is appended to this Report, showing the actual Receipts and Expenditure for the past year.

5. The estimated assets of the Society for the year 1868 are as follows :—

242 Members at £2. 2s.	...	£508	4	0
15 1st Class Associates at £2. 2s.		31	10	0
25 2nd Class do.	£1. 1s.	26	5	0
<hr/>				
282 Annual Subscribers	£565	19	0
20 Vice-Patrons, Life Members, and Life Associates (Dividends on Life Subscriptions invested ; say)	}	10	0	0
<hr/>				
302 Total	£575	19	0
<hr/>				

6. This income (exclusive of the balance from 1867) will barely meet the necessary expenditure of the Institute, without trenching upon Life Subscriptions ; and, unless the annual contributions for the present year are more promptly paid than hitherto, it may, as a matter of prudence, be requisite to defer the publication of the Journals, so as to lessen the cost of printing in the year, which the Council will extremely regret.

7. The expense of carrying on the business of the Institute is now greater than in the first eighteen months of its existence ; the Council having thought it desirable, by the appointment of a paid Secretary of experience, to make the operations of the Society more extensively known to the scientific world. That the pecuniary result of this appointment has not yet been as successful as was hoped, is, perhaps, partly attributable to the abnormal condition of affairs out of doors, affecting especially the incomes of the middle classes, and by which even old established societies have been materially affected. The cost of the Journal, including the reporting of the discussions, is a considerable, and our chief expense. There is now, also, as the Members and Associates are aware, the salary of the Secretary, Mr. Leifchild, and, till recently, that of the Clerk

(with whose services the Council found it necessary to dispense), as well as the hire of rooms, and other contingent expenses, such as stationery, advertising, postage, and incidental printing. The Council venture, however, to hope, that during the ensuing recess, when the energy of the Secretary can be extensively devoted to correspondence with gentlemen interested in pursuits kindred to the objects of the Society, not merely the usefulness but the finances of the Institute will be improved by a large accession of new Members and Associates.

Meetings.

8. The Council revert with satisfaction to the substantial work done by the Society, as evidenced by the following list of papers and discussions for the Session 1867-68, viz. :—

On Geological Chronology, and the Cogency of the Arguments by which some Scientific Doctrines are supported. (In reply to Professor Huxley's Address delivered at Sion College on 21st Nov., 1867.) By J. REDDIE, Esq., Hon. Sec. V.I. (Read 16th Dec., 1867, and discussed 6th Jan., 1868.)

On the Antiquity of Civilization. By the Rev. J. H. TITCOMB, M.A., M.V.I. (20th Jan.)

On Life, with some Observations on its Origin. By J. H. WHEATLEY, Esq., Hon. Loc. Sec. V.I., Sligo. (3rd Feb.)

On the Triunity of Life. By EDWARD HAUGHTON, Esq., M.D., M.V.I. (3rd Feb.)

On the Unphilosophical Character of some Objections to the Divine Inspiration of Scripture. (In reply to Professor Huxley.) By the Rev. WALTER MITCHELL, M.A., Vice-President V.I. (17th Feb.)

On Comparative Psychology. By E. J. MORSEHEAD, Esq., Hon. For. Sec. V.I. (Read 2nd March.)

On Theology as a Science. By the Rev. A. DE LA MARE, M.A., M.V.I. (Read 16th March.)

On the Immediate Derivation of Physical Science from the First Great Cause. By RICHARD LAMING, Esq., M.R.C.S. (Read 6th April.)

On some of the Philosophical Principles contained in Mr. Buckle's "History of Civilization," in reference to the Laws of the Moral and Religious Development of Man. By the Rev. C. A. ROW, M.A., M.V.I. (20th April.)

On the Nature of Human Language, and the Necessity of Scientific Phraseology, &c., for the Interpretation of Holy Scripture. By the Rev. JOSEPH

BAYLEY, D.D., Principal of St. Aidan's College, Birkenhead, Assoc. V.I. (4th May.)

On the Probable Common Origin of the American Races with those of the Old World. By the Rev. J. H. TITCOMB, M.A., M.V.I. (Read 18th May.)

On the Biblical Cosmogony Scientifically Considered. By GEORGE WARINGTON, Esq., F.C.S., M.V.I. (To be read 1st June.)

On some Uses of Primeval History. By DOMINICK MCCAUSLAND, Esq., Q.C., LL.D., M.V.I. (To be read June 15th.)

9. The principal subjects discussed this Session were certain issues raised by Professor Huxley in an address delivered by him in Sion College, before the London clergy, on 21st Nov. last, and the Positivist principles enunciated in Buckle's *History of Civilization*. Professor Huxley's address appeared to require the especial attention of this Institute, as it was the almost solitary attempt that has been made since the Victoria Institute was founded, to revive the challenge made more ostentatiously in the *Essays and Reviews*, and by Dr. Colenso, now some years ago, to the believers in revelation, to justify their faith in the light of scientific discovery. The Council cannot here enter into the merits of the controversy upon this re-discussion; but they refer to it, in order to remind those interested in such questions, that the battle is not yet fought out. But important as have been the issues raised between the theories of material science and the truths of revelation, they are as nothing to the philosophical scepticism and the virtual or avowed atheism of M. Comte's system of *Positive Philosophy*, the principles of which are now being insidiously used to assail the Christian faith, and even to overthrow the first principles of all rational religion.

10. The Council hope that during another Session this Institute will be able to secure a series of papers against the various phases and developments of Positivism, that will further prove how well-timed and how beneficial the establishment of the Victoria Institute has been.

11. Several members have expressed disappointment at not having had a complete programme of our Papers for the Session sent to them at its commencement. None can have been more disappointed that this could not be accomplished than the Council themselves. And they would now most earnestly urge upon intending Contributors of Papers the

desirability of their sending in their Essays early, during the ensuing recess, to enable the Council to comply with this general and natural wish of themselves and the other Members and Associates. More frequent special notices and advertisements of the subjects to be discussed at each meeting might doubtless be put out; but not, it should be remembered, without considerable expense.

Publications.

12. Volume II. of the *Journal of Transactions* will be completed by No. 8 of the Journal, which will contain the Vice-President's Paper on Crystallography, and probably a Mathematical Paper of importance, which was not suitable for reading and oral discussion. But No. 9, commencing Vol. III., may probably appear before No. 8 is completed. The Council wish to remind members that a binding case for Vol. I. is now to be had on application personally, or by letter, at the office.

Conclusion.

13. In conclusion, the Council can only reiterate, that the full realization of the objects of the Victoria Institute now depends entirely upon the increase of our Patrons, Members, and Associates. That such a Society as ours was wanted, and that it can work and do good service, is no longer a matter of doubt. The extent of its work and of its consequent usefulness, however, must depend upon its "ways and means"—in other words, upon the extent of support it receives, or the number of its Subscribers. From the first, as will be seen from the original Prospectus, it was devised upon a large scale; and from its objects, and the interests at stake, it must be evident that it ought not to be a small Society. The Council invite the present Patrons, Members, and Associates to co-operate with them, to make the Society speedily a large one.

Signed on behalf of the Council,

WALTER MITCHELL, *Vice-President*,
CHAIRMAN.

Captain Fishbourne, the Treasurer, then read the Annual Balance-sheet as follows:—

SECOND ANNUAL BALANCE-SHEET, from 1st January to 31st December, 1867.

RECEIPTS.				EXPENDITURE.			
£.	s.	d.		£.	s.	d.	
Balance from 1866—brought forward				To Wyman & Sons, for Printing			
Do. Petty cash				Hardwicke for "Scientia Scientiarum" (3rd and 4th 1,000)			
1 Vice-Patron and Life Member				Ortner & Houle for engraving and stationery			
5 Life Members at £21 each				Rent of Offices at 9, Conduit-street			
147 Annual Members at £2. 2s. each				Salary of Clerk from December 31, 1866, to December 31, 1867			
8 Annual Members at £2. 2s. each				E. H. Scovell, for Reporting Meetings from November, 1866, to June, 1867			
8 Entrance fees				Disbursements by Clerk, Fuel, &c.			
7 Associates (1st class) at £2. 2s. each				Advertising			
21 Associates (2nd class) at £1. 1s. each				Postage (Letters, Journals, &c.)			
2 Members' Subscriptions for 1868 (with entrance fees)				Mrs. Wilkins, for Refreshments at Meetings from November, 1866, to June, 1867			
Per H. B. Owen (Balance in his hands)				Commission to Bankers			
Michaelmas Dividends on £291. 10s. invested in New Three per Cent. Annuities				Balance in hand			
Sale of Journals at Office				£599 0 9			
78 17 2				Brought forward			
Balance brought down				Subscriptions for 1866 still due.			
Subscriptions for 1866 and 1867 since paid.				11 Members			
2 Life Foundation Members				Subscriptions for 1867 still due.			
2 Annual Members for 1866				49 Members			
33 do. for 1867				Examined and found correct,			
3 New do. for 1867				JOHN J. LIDGERT, } Auditors.			
do. entrance fees				W. VANNER, }			
5 Associates (2nd class)				£335 1 2			
£209 1 2							
Carried forward							

Rev. M. DAVISON.—I beg to move that the report be adopted, printed, and circulated. It is unfortunate that the number of our members should not have increased; but no doubt there are several causes which have contributed to that result. I have often thought that we should adopt some means of making our existence better known, and also the object for which we have associated together. (Hear, hear.) Over and over again, when I have recommended other clergymen to join the Victoria Institute, I have been met by the question: "What is it? I have never heard of it." I knew nothing of the society two years ago myself; but a paper concerning it was placed in my hands, and I joined the Institute in consequence. If every member would only undertake to bring a new member into the society, which would not be difficult, we should double our numbers at once. Then it appears from the report that there is not so punctual a payment of members' subscriptions as there should be. I am bound to say that this is scarcely honourable. The secretary would never be required to send notices of overdue subscriptions to members, if those members would only make it a matter of conscience, as they ought, to pay their subscriptions punctually when they are due, without notice. It is impossible that any institution with so many expenses can be properly carried on without a punctual payment of subscriptions. This society supplies a want that has been felt by very many, and it is specially engaged in the important duty of conducting scientific research in reference to its theological bearings. There has unhappily been a great deal of ignorance of scientific matters among clergymen. I should like to ask a hundred clergymen as to the present state of geological knowledge with regard to the first chapter of Genesis. I will venture to say that ninety out of the hundred would get no further than the period theory of Hugh Miller, against which we know there are very strong objections to be raised. A society like this, I say, was greatly wanted, and if clergymen only had its claims properly put before them, they would join it and take the deepest interest in its proceedings.

Rev. C. A. Row.—I beg to second the motion. I quite agree with Mr. Davison as to the desirability of making the society more generally known, for I am satisfied there are many religious men in the country, more or less given to scientific investigation, who are ignorant as to the position in which science now stands with regard to religion. I think the discussions also are quite as valuable as the papers. By having good discussions you make good papers more perfect, while bad papers obtain the fate they deserve; and what we really want is to get every paper thoroughly discussed. There is a great mass of infidelity in London, and I think it would be a good thing, as an endeavour to meet it, to have small papers, written in a simple and popular style, on scientific matters, for circulation among the people. I think such a course would have a very beneficial effect, and would increase the usefulness and influence of this society.

The motion was unanimously agreed to.

Mr. J. CORDEROY.—I beg to move that the following members of Council be elected for the ensuing year:—

OFFICERS AND COUNCIL FOR 1868-69.

President.

The Right Honorable the Earl of Shaftesbury, K.G.

Vice-Presidents.

Philip Henry Gosse, Esq., F.R.S.

Rev. Walter Mitchell, M.A.

Charles Brooke, Esq., M.A., M.B., F.R.S.

Honorary Treasurer.

Captain E. Gardiner Fishbourne, R.N., C.B.

Honorary Secretary.

James Reddie, Esq., Hon. Mem. Dial. Soc., Edin. Univer.

Honorary Foreign Secretary.

Edward J. Mordaunt, Esq., H.M.C.S.

Council.

Robert Baxter, Esq. (Trustee.)

Rev. A. De la Mare, M.A.

Robert N. Fowler, Esq., M.A.
(Trustee.)

William H. Ince, Esq., F.L.S.,
F.R.M.S.

John J. Lidgett, Esq., B.A.

Alexander McArthur, Esq., F.R.G.S.,
F.A.S.L.

William M. Ord, Esq., M.B.

Rev. J. B. Owen, M.A.

Captain Francis W. H. Petrie,
F.G.S.

Rev. Robinson Thornton, D.D.

George Warrington, Esq., F.C.S.

Alfred J. Woodhouse, Esq., M.B.I.,
F.R.M.S.

Rev. W. Reynier Osens, M.A.

Alfred V. Newton, Esq., F.A.S.L.

William Vanner, Esq., F.R.M.S.

S. D. Waddy, Esq., Barrister-at-
Law.

Rev. James H. Rigg, D.D.

Rev. C. A. Row, M.A.

Rev. J. H. Titcomb, M.A.

Secretary.

W. H. S. Aubrey, Esq.

Clerk.

Mr. John Wills.

I have the pleasure of knowing a number of these gentlemen ; I am sure they will serve the interests of the society. With regard to the present position of the Victoria Institute, I think it would not be a bad idea if members would forward to their own personal friends a brief statement of the objects of the society, together with a list of those upon the council, and I have no doubt that in that way we might largely increase the numbers of our members.

Captain COOPER GARDINER briefly seconded the motion, which was carried unanimously.

Rev. W. MITCHELL, Vice-President. — We have to-day to regret the absence of Mr. Reddie, who has been called upon to be present on the Grand Jury at Clerkenwell. We must regret his absence the more, as we know how much he has done in advancing the progress of the Institute. No

one could have devoted himself to its interests more heartily than he has done on all occasions. Unhappily he has recently met with a severe domestic affliction, and he has also suffered in his own health, and the consequence has been that he has not latterly been able to use the same energy in advancing the cause of the institution as he did at first ; and our deficiency in point of members has, no doubt, been greatly owing to that circumstance. To his exertions we have been indebted for the great success we have previously met with. I cannot do better than read you a letter he sent me, announcing that he would not be able to be present at our meeting to-day, and which will give you, more fully than any words of mine could do, his own views with regard to the society :—

Bridge House, Hammersmith, W.,
23rd May, 1868.

MY DEAR SIR,—Unfortunately I am summoned to serve upon the Grand Jury at Clerkenwell on Monday next, our anniversary. I fear this may prevent my being present at the Meeting altogether, or at least in time for business. I need not say how much I regret this ; and, all the more, because I fear the members will expect some explanation, besides what is hinted at in the Council's Report, as to the apparent stagnation in some of our operations during the past year ; and they may naturally expect this explanation to come from me.

To none, however, more than to myself, can the disappointment have been greater at seeing that our numbers should have been barely kept up, instead of being largely increased. Our anticipations in this respect were sufficiently expressed in the circulars issued last summer, upon resolving to engage the regular services of a paid secretary. This the council considered had become both a necessary and prudent step, not only in order to secure greater regularity in the management of our office affairs than was possible when they were in the hands of the late clerk, Mr. C. H. H. Stewart, with merely such superintendence as Captain Fishbourne and myself could give, while ourselves very closely engaged in other avocations elsewhere ; but also in order to make the existence and work of the society better known, and thus to draw fresh supporters to the good cause, with something like the promptitude with which our first numbers were enrolled, and the foundation lists filled up with nearly 300 names.

The state of my health last summer gave warning of the impossibility of my being able to continue all the secretariat duties, after our numbers had become so large and the editorial work alone had grown so heavy (unless, indeed, I had neglected all prior duties and my private affairs), and this rendered the appointment of a regular secretary a necessity. But still I had hoped to be able to give aid from time to time, especially in the endeavour to recruit our ranks, and in otherwise assisting our new secretary in his most important work. You know, however, how all such anticipations were destroyed ; and that subsequent illness and other hindrances have unfortunately still more completely prevented me from rendering any but the least service to the Institute. Indeed, I have often felt that it was perhaps my duty to resign the honorary secretaryship altogether ; and I have only refrained from doing so because I knew no one to take it up.

I beg, therefore, that you will be good enough to explain to the meeting how much I regret this state of things ; and that I can only be regarded at present as nominally holding my position. Also how much I feel that

(notwithstanding Mr. Leifchild's appointment) the interests of our important society require the active co-operation of another honorary secretary, able and willing, *con amore*, to do work for it, in a way that at present I cannot hope to perform; and that I only now hold office, because I am unwilling to quit the post till this want is supplied, and the Institute is better served.

I need not say to you (and I trust not to many of our members) how sorry I am that I have been and am quite unable to work for the Victoria Institute as it was once my privilege and greatest pleasure to do; and I feel that I would neither be doing justice to myself, nor to the cause we have all so much at heart, were I not frankly to offer this explanation, and ask you to give some indication to the members and associates in my absence, that the falling off in my exertions must not be attributed to any abatement of interest in our society, which I ever feel more and more is truly doing good service in the cause of truth, and, most truly, *ad majorem Dei gloriam*.

Believe me,

My dear Mr. Mitchell,

Always yours most faithfully,

J. REDDIE,

Hon. Sec.

REV. WALTER MITCHELL, M.A.,

Vice-President Vict. Inst., &c.

I think we should not be doing our duty if we did not take the opportunity afforded by his absence for expressing our warmest thanks to him for his great exertions in the interest of the society, and which are probably known to no one so well as to Captain Fishbourne and myself. With regard to the suggestions which have been made for furthering the interests of the association, I cordially concur in them, and I hope every member will act up to them. As to the desirability of publishing reports of our meetings in the newspapers, I am fully alive to that, and I have spoken myself to the chief editor of one of the daily papers on the subject; but his reply to me was:—"We make it a rule not to notice any such societies, and we cannot do it." The only thing for us to do is to advance ourselves by doing sound work. It will only be by showing that we are perfectly up to our work that we shall succeed in our objects, and that I think we are doing. This being the first general meeting at which Mr. Reddie has not been present, I propose that our thanks be given to him for his great exertions on our behalf, with the hope that his health may be soon restored, and that we may have the same help from him in the future.

Captain FISHBOURNE briefly seconded the motion, and after a few words in support from Mr. Alexander M'Arthur it was unanimously agreed to.

The CHAIRMAN then delivered the following address to the meeting:—

ANNUAL ADDRESS.

The Simplification of First Principles in Physical Science.

LADIES AND GENTLEMEN,

HAVING recently been requested to address you on the present occasion, I wish it had been in my power to have thrown my observations together in a more satisfactory form than that in which they are now presented. The subject on which I propose to address you is "the Simplification of First Principles in Physical Science, as an evidence of the unity and comprehensiveness of Creative Wisdom." There are no recent facts or investigations connected with physical science in which that has taken place so conspicuously as in the establishment of the principle of the conservation of energy, and the correlation of its physical modes or forms. On this subject a very suggestive treatise has been written by Mr. Grove, and upon that treatise some excellent observations were made in a paper addressed to this Society some time since by Professor Kirk. Some of the observations he made with regard to the inconclusiveness and want of logical accuracy in some of the arguments adduced in that treatise, sprung out of the indefinite use of terms by Mr. Grove. It is upon that subject that I should like to offer you a few remarks. The title of Mr. Grove's treatise is "The Correlation of Physical Forces," and what has been frequently mentioned as "the conservation of force;" but I prefer to reject the latter term, and to speak of the conservation of energy, and the correlation of its physical modes and forms. The term "force" is not an applicable term, because it is not definite. It is a term which has been applied to several distinct things. It is applied to that to which I would limit it, and also to that which force produces, namely, *energy*; and it has also been applied to the mere non-existence, or negation of energy, or what in former times was called the *vis inertiae*, which was the supposed positive existence of the power in a body to remain at rest. But that evidently is no force at all: it is simply the non-existence of any form of energy by which any portion of matter may be put in motion. Both force and energy may

be considered as *actual* or existing, or as *potential*; that is to say, as placed under circumstances under which they may be called into action at any time. Now, as an illustration of this point, the term "force" has been indiscriminately applied to different things. I may remind you that it is a very common thing to speak of the *force* of a charge of gunpowder, and also of the *force* of the shot propelled by it. It is true that the gunpowder has force, but the shot has only energy. The shot has energy communicated to it by the force of gunpowder, and there is clearly a misapplication in the same term being applied to those two totally distinct things. Again, the force of gunpowder may be considered as potential when the gunpowder is stored away in a magazine. It is a force capable of being called into action at any moment; and the moment the gunpowder is ignited the force becomes actual. So again, energy may be either actual or potential. It may be actually in existence, or it may only be capable of being called into existence. Thus a body, in falling to the ground, acquires actual energy. Energy may be defined to be the power of doing work—of effecting some change—the putting of matter in motion, and producing some effect. If a body be raised to a higher position than it originally occupied, and there maintained, it possesses potential energy. It has the power of doing some work when it is allowed to fall, and acquires energy in the act of falling. I would here remark that both matter and energy are alike indestructible:—it is not within human power to create or to destroy either matter or energy. The indestructibility of matter is a fact so well known that perhaps I need not say a word on the subject; but at the same time, in order to make it familiar to those who are not acquainted with scientific details, I may give one illustration. Suppose I take a bit of gun-cotton and ignite it, you see a flash, hear a noise, and the whole of it disappears. But the matter of that gun-cotton is not destroyed. It is converted, by chemical agency, into invisible gaseous matter; but it has just as much an existence as it had before. And now I will explain, by an illustration, what is meant by the conservation of energy. I may take a hammer, and by the force of my arm exerted upon that hammer I may drive a nail into a block of wood. Or, instead of employing the force of my arm to urge the hammer upon the nail, I may use the same amount of muscular force in raising the hammer, by means of a string passing over a pulley. In the one case the energy that is exercised by my arm is actual, being applied in giving a blow with the hammer upon the nail. In the other case the force of my muscles is employed in raising the weight; and

so long as the weight remains suspended, the energy which that weight has acquired by the employment of the string and my arm is potential only. But whenever that weight is allowed to fall, supposing it is so circumstanced as to exert its whole energy upon the nail, it will produce exactly the same effect in driving the nail into the wood which would be produced by the hammer when struck upon the nail by my hand. That is a simple illustration to show that energy may be so acquired as to remain in a potential form, capable of being applied at any subsequent time ; but whenever it is so applied, the potential becomes actual energy, exactly the same in amount as that energy which was employed in producing it. In order to form a clear conception on this subject, it is necessary to say something about the *diffusion* of energy. What becomes of energy when it is employed ? That is a point which it is not very difficult to answer. It is not destroyed. Take an example : when a stone falls to the ground, it strikes the ground with a certain amount of energy. Now what becomes of that energy ? It is occupied in producing disturbance—molecular motion—at that point of the earth's surface on which it falls, and that molecular disturbance produces a minute degree of heat, and the energy is expended in producing that heat, which, however small it may be, becomes diffused by radiation, and is lost sight of. It is diffused, but not destroyed. That heat is the result of the application of dynamic energy, is evident by observing what happens when a rifle-ball strikes an iron target against which it is directed. What becomes of the energy of the ball ? It is expended in the production of heat ; for the ball, which was a solid mass when it reached the target, becomes fused, and is scattered in splashes as though it were liquid.

It is a remarkable fact that, in the earlier days of scientific investigation, material forms were ascribed to all the various forms of physical energy. Light was supposed to consist of material particles, thrown off from a luminous source, and producing an impression upon the organs of vision. In the same way heat was supposed to be a material substance—caloric—which was in some way thrown off from the heated body. Electricity and magnetism were supposed to be fluids. In electricity there were supposed to be two fluids combined, and it was thought that the manifestation of electrical effects consisted in the separation of those two fluids. Magnetism also was supposed to consist of two fluids, which were supposed in the same way to co-exist in magnetic bodies, and it was thought that when they were disturbed or separated the effects of magnetism were manifested. As

observation increased, some of these ideas led to considerably forced hypotheses, as for example the Newtonian hypothesis of the material nature of light. When the peculiar phenomena of diffraction and interference became known, it was evident that the hypothesis of the material nature of light required some peculiar modification, and this strange modification was suggested by Newton himself, that the particles or molecules of light were subject to periodical changes of condition, and the hypothesis was formed, with reference to them, that they might be probably egg-shaped, perpetually turning over endwise in their progress; and that if they impinged endwise on a medium they would enter it, while if they came sideways they would rebound from it. This was an exceedingly strained and forced hypothesis, formed to meet those changes of condition which are identical with what are now known as the different phases of the waves or undulations of light. With regard to the caloric theory, that again led to some still further hypotheses, when it became known, from an experiment of Leslie, that if a ball of ice were placed in the focus of a reflector, and the bulb of a thermometer were placed in the other focus, the temperature of the thermometer was lowered. From that Leslie was led to form this hypothesis, that there was a radiation of absolute cold as well as of absolute heat. But that is explained now on the supposition that heat consists of motion, and on the theory of exchanges. I can best explain that by an illustration. Suppose on each side of a room there was a harp, both harps having their strings tuned exactly in unison. It is known very well that if a string belonging to one of them be sounded, it will put that string of the other harp, which is in unison with it, into vibration; and that phenomenon is known as the reciprocation of sound. In the same way, supposing one of the strings to be very lightly sounded and the other to be sounded loudly, then the vibrations of each string are communicated to the other, the sound produced by one string being increased, while the sound produced by the other is diminished. That exactly illustrates the theory of exchanges with regard to heat; namely, that each body is capable of radiating the heat it possesses; and because two bodies are capable of imparting their heat to each other, it follows that one will lose and the other will gain heat, if their temperatures were previously unequal. And thus it will be seen that the theory now generally received, that heat consists in molecular motion, entirely supersedes the hypotheses which had been previously formed. It is obvious also, that if any one of these various forms of physical energy consists in

motion only, they must all consist in motion only, because they are many of them really convertible one into the other. Those motions in which the various forms of physical energy are exerted, are all of a vibratory character—that which is the case with regard to sound is also the case with regard to light. It has long been received as an axiom that light consists in vibrations, and from the strong analogy existing between light and heat—from the circumstance of their both being subject to the same laws of reflection and refraction, and even to what is called polarization, the different wavelengths of heat being separated in the same way as the different prismatic colours of light—there can be no doubt that they are essentially of the same nature. But in order to meet the phenomenon of polarization, it is necessary to suppose that the vibrations of light and heat are transverse, while the vibrations of sound are longitudinal. There can be little doubt that electricity is motion also, and motion only, and that there is no such thing as an electric fluid. I am not aware that it has yet been determined what form electric motion assumes, but there are strong reasons for supposing it may be helical, like the form of a corkscrew. If motion of that kind takes place, that which would be right-handed motion if viewed in one direction, becomes left-handed motion if looked at in the other, and that would account for the phenomena of positive and negative in electricity. Then there are strong reasons for supposing that magnetic energy consists of similar waves of motion, one of the strongest of those reasons being found in a fact, observed many years ago, that if a piece of copper be placed between the poles of a powerful magnet, and made to rotate, the rotation will continue so long as the magnet remains inert, but when a current of electricity excites the magnet, the rotating body is immediately arrested; and if it be forcibly rotated, a considerable amount of heat is produced. If a piece of fusible metal be introduced into a copper cylinder between the poles, after a short period of rotation, it may be poured out in a melted state. It may here be remarked, that in this case there is a constant relation between the amount of energy expended in rotation and the amount of heat produced.

I might give you many examples of the transformation of various forms of physical energy into one another—of dynamical energy into light and heat for instance, but I will only take one well-known fact as an illustration. A blacksmith who wishes to light his fire, will often take a cold nail, and placing it upon his anvil, he will strike a succession of

peculiar drawing blows upon it, which will soon raise it to a red heat, and enable him to light his fire. The nail becomes red-hot and emits its heat, and that light and heat are clearly obtained at the expense of dynamical energy with which the hammer had been used. There are some experiments which show in a striking manner the connection between light and electricity. I may speak of the phosphorescence of fluor spar, which if heated to a slight degree, becomes luminous for a short period. But after that light had been produced by heat and has departed, it will not immediately reappear under the influence of renewed heat, unless the fluor spar be subjected to the additional influence of an electrical discharge, and then the light may be again produced. That seems to indicate a remarkable connection between electricity and light. Again, in some machines recently invented, a powerful current of electricity is produced simply by turning the winch of the machine by hand. In that instance the dynamic energy of the hand is converted into electric energy and manifested as such. Thus it appears that all these various forms or manifestations of physical energy may be considered as modes of motion, and the hypothesis of their corporeal existence—of their being forms of matter—is entirely superseded. As to the media by which these forms may be transmitted much may be said, but time will not permit me to go into that part of the subject.

The common medium of communication between external objects and our organs of sense, may also be supposed to be vibratory motion. Sound as we all know is conveyed to the ear by the vibrations on the air, and the impressions of light are conveyed to the eye, and of heat to our organs of sensation, also by vibrations. The senses of sight, of touch, and of hearing are most evidently affected by vibrations; but I think there is strong reason to believe that the senses of taste and smell, which are analogous, are affected in a similar manner. It is well known that the senses of both taste and smell are considerably blunted by the effect of cold—that if a piece of ice be taken in the mouth the taste is rendered comparatively insensible, and that the odours of flowers are only perceived with difficulty in cold weather. It is notorious that odours of all kinds, whether pleasant or unpleasant, are much more readily perceived in warm than in cold weather, and thus the vibratory motion of heat seems to be the medium of communication between the senses of smell and taste and external objects, much in the same way as the organs of seeing and hearing are affected by vibratory motion.

It is, however, much to be regretted that many of these

investigations have been made to assume a tendency, the very opposite of that which this Society has been established to promote. Such investigations have often been made to assume a tendency either to pantheism or to materialism, and it is much to be regretted that that should have been the case. Still I believe that whatever arguments, based on scientific truth, may be urged in favour of pantheism or of materialism, they may always, on close examination, be found to have a weak point, and to be untenable. I will give you an illustration of that. I remember very well a lecture, delivered at the recent meeting of the British Association at Dundee, by an eminent philosopher, on the subject of matter and force, which afforded a good example of the truth that the *suppressio veri* is very often closely allied to the *suggestio falsi*. The argument made use of was this: An experiment was shown, in which, by the action of acetate of lead upon zinc, what we know as the zinc or lead tree was formed. The molecules of lead are released from the acetic acid by those of zinc, and are gradually deposited, and being deposited in that gradual manner, they attach themselves one to the other in certain definite directions, according to the nature of the molecular attraction, which exists between particle and particle of that particular kind of matter. They undergo crystallization, and you have the lead formed into thin crystalline laminæ. The same thing may take place in a solution of silver, with differently formed crystalline laminæ; and it results simply from the molecules of a particular substance being allowed gradually to agglomerate together, and to take up that position which their polar attraction for each other may indicate, and which will be different with different substances. If they are thrown together suddenly, without being allowed to take up their successive positions, then no crystallization at all, or imperfect crystallization, takes place. This constitutes the difference between loaf-sugar and sugar-candy. In loaf-sugar the crystallization takes place very rapidly, but in sugar-candy the formation takes place gradually, as the water evaporates, and the particles of sugar have time to take up that position which their nature dictates, and growth takes place. The crystallizations of the lead tree in the lecture I referred to were compared to fern-leaves, and they certainly have a very leaf-like appearance. The lecturer went on to say that just as the molecules of lead and silver form crystals under these circumstances, like beautiful leaves, so the union of carbon, from the carbonic acid of the atmosphere and other sources, and hydrogen, forms certain matter under the influ-

ence of light and heat, which results in the beautiful leaves of the various plants and vegetables of the world. Now the *suppressio veri* consisted in this: the lecturer did not say that, under all circumstances, his metallic leaves would always be formed by lines inclined exactly at the same angles to each other, and exactly representing the same crystalline forms; and he did not say that the same carbon and hydrogen, the same elements of vegetable existence, would form all the varieties of vegetable life which we see around us, not simply by molecular attraction, as the crystals of lead or silver are formed, but under the influence of a prior existing germ, derived from another individual of the same kind, which determines the particular form in which the molecules of inorganic matter attach themselves together, so as to form a particular plant. The lecturer did not say that therefore his conclusion was altogether untenable; that the formation of crystals is simply the result of the attraction of molecules of inorganic matter, while the formation of a plant is due to the influence of a prior existing germ formed by a plant of the same species: whence we are, step by step, carried back to the great First Cause and Creator of all things. The lecturer went on to say that if, in the laboratory of the chemist, the various elements of the tissue of a baby could be formed, he did not see why a chemist should not be able to make a baby. But I can see very well why, under these circumstances, a chemist could not make a baby. (Laughter.) In the first place there is not in the laboratory of the chemist the slightest approach to the formation of any living tissue; and even if the chemist could form the coagulable lymph, that fluid separated from the blood, from which all living tissues are formed in the higher organizations, would not bring him a bit nearer to the formation of tissues than before: but even supposing that he could form all the various tissues, we should not yet have the baby. We are told in the second chapter of Genesis that out of the dust of the earth God created Adam, and "breathed into his nostrils the breath of life." Adam was not a living being until the breath of life had been breathed into his nostrils; and it is evident to the meanest comprehension that even supposing the material substance of the human body could be constituted in the laboratory of the chemist, all that distinguishes a living being from dead matter would still be wanting; and that, at all events, is due to the operation of Divine power alone. Give the chemist even a perfect organism, from which the spark of life has but this moment fled, and can he rekindle it? No: he may indeed galvanize the limbs into a mimic

life, while the individual vitality of the muscles yet remains; but that is the narrow limit of his power. The preceding is a good illustration of the inconclusive and unsatisfactory nature of arguments of this sort, and of the readiness with which they may be met if fairly investigated. The general tendency of the argument of materialism may be summed up thus: if we can have any kind of spontaneous generation,—any spontaneous production of a living being, whether plant or animal,—then by a succession of changes and by what is called in the Darwinian theory the principle of selection, by degrees we shall get a higher organization, and then a higher still, until we arrive at the highest forms of life. And that is tantamount to saying that we depose the Creator from His throne, and set up the thing created in His place. I think I have said enough to show that all the results of modern scientific investigation, and the facts with which we are acquainted, render it necessary that we should ascend from effect to cause. We must necessarily ascend from existing individuals and existing causes to the Great First Cause, whom we must assume to be independent of matter and of material existence. (Cheers.)

Rev. W. MITCHELL.—I beg to move a vote of thanks to Mr. Brooke for his valuable address, and to express a hope that he will follow up the subject at some future time, by giving us a paper on the distinctions existing between organic and inorganic structures—an important subject, on which Mr. Brooke would no doubt be able to throw a good deal of light. Chemists had lately been boasting that they could produce organic matter; but though they might be able to unite carbon, hydrogen, nitrogen, oxygen, &c., in certain proportions, so as to resemble certain organic substances, the result, after all, was only dead matter, for the chemist was not able to impart to it the vivifying principle. Mr. Brooke had referred to some of the wonders of crystallization. There was, no doubt, an apparent analogy between certain crystalline forms and certain ferns, and it had been assumed that those ferns were produced in a similar manner to the crystals; but there was no real analogy. In the crystalline formations obeying the crystallographic laws of inorganic matter, there was not one particle of organic structure. It would be better if philosophers would remember that their highest office was to convey to others the wisdom which they saw manifested around them in God's works, and exhibited as much in the inorganic as in the organic world. The crystal was as wonderful in its place, and as evidently the work of God, as was man himself.

Mr. REDDIE (who entered the room at the close of Mr. Brooke's address) briefly seconded the motion, which was carried by acclamation.

Mr. BROOKE having acknowledged the compliment, the proceedings terminated.

ORDINARY MEETING, JUNE 1, 1868.

THE REV. WALTER MITCHELL, M.A., VICE-PRESIDENT, IN
THE CHAIR.

The minutes of the last Meeting were read and confirmed.

The election of the following Member was announced :—

John Poyer, Esq., 13, St. Mary's Road, Westbourne Park, W.

Mr. Warrington then read the following paper :—

*THE BIBLICAL COSMOGONY SCIENTIFICALLY CON-
SIDERED. By GEORGE WARRINGTON, ESQ., F.C.S.,
Mem. Vict. Inst.*

THE history of creation is the only part of Scripture which can be said to involve direct scientific teaching. Elsewhere, indeed, the facts and phenomena of Nature with which Science has to do are frequently alluded to; but inasmuch as these are never the object of Scripture teaching, but only the accessories or illustrations of it; inasmuch, also, as in all such cases there existed a natural knowledge of the matters referred to, on the part both of writers and readers; it is open to the interpreter of Scripture to repudiate all scrutiny or objection of science, on the ground that scientific accuracy was wholly unnecessary to accomplish the end that Scripture had in view, and general fairness of use all that the analogy of Scripture-history would lead us to expect. Whether this twofold plea be considered sufficient or not in the cases referred to, it is clear that in regard to creation it is of no avail. For here no natural knowledge of the facts could exist, to whose partial and phenomenal character any scientific inaccuracy in the record might be ascribed. The knowledge of nature possessed by the original writers and readers of the Bible (revelation being put on one side) could plainly have extended

at most no further than the first appearance of man upon the earth. But the Scriptural cosmogony deals in the main with nature as it was before man's appearance. The narrative which it contains must either, therefore, be a mere string of fancies, the product of human imagination ; or, if true, it must be the result of Divine revelation. But, again, the object which this cosmogony has in view is far too intimately connected with the facts it details to allow these to be regarded as non-essential or unimportant. Its design is not merely to use the history of creation in illustration of spiritual truth, but *de novo* to set forth what that history was, and so convey that teaching which creation rightly regarded is intrinsically fraught with. These considerations show at once the unique position and exalted claim of the Biblical cosmogony, as a professed revelation of otherwise unknown natural facts, whose narration as facts is an essential part of the purpose in view. Whatever may be said, then, of other parts of Scripture, where scientific matters are more or less distantly and indirectly touched upon, this opening section not only allows but demands the keenest scientific investigation. To bestow such investigation is the object of the present paper.

In comparing together the conclusions of inductive science and the statements of Genesis, it is of prime importance that we exclude, so far as possible, the interfering element of *theory* ; and this on both sides. That we exclude, that is, on the one hand, all mere hypotheses concerning the past history of the world, which are unsupported by facts ; and, on the other hand, all notions concerning the Biblical cosmogony which are unwarranted by the original text, read as those would have read it for whom it was at first designed. To accomplish this, it will be inevitable that we enter somewhat into exegesis. This, however, will be done as slightly and briefly as may be, since our main object is not the interpretation of this part of Scripture as such, but the comparison of what it says with the discoveries and inferences of modern science. Only, to make such a comparison fairly, it is indispensable that we rightly understand both sides. But for that interfering element, human theory, there need scarcely have been any observations on exegesis. Well-nigh all that is said on this score will be said to put aside the false and artificial crusts with which successive generations of commentators have covered the original text, and so get back once more, if it may be, to its simple and natural meaning. To this end, three fundamental propositions may be laid down, which, when duly weighed, will be found to furnish nearly all that we need.

1. The Biblical cosmogony was intended primarily for those unacquainted with natural science.

2. It was intended for no one single nation or place, but for the whole world.

3. It was intended to exhibit, through the medium of facts in creation, the relation of God to Nature, and Nature to God.

Few, if any, would be prepared to dispute these propositions thus broadly stated. They need no defence, and but little argument in their support. Our main business will be to trace out the important consequences which are involved in their admission.

1. *The Biblical cosmogony was intended primarily for those unacquainted with natural science.*—Then must its interpretation also be altogether independent of the conclusions and researches of science. If the meaning of its language, or the significance of its statements, is made to depend upon modern scientific investigations, in such a way that until these were carried out its purport could not rightly be perceived, then it becomes at once, to all past ages, an enigma waiting for solution. With this, however, its simple language, its historic character, and its didactic purpose, are altogether inconsistent. A plain, natural sense, moreover, it certainly has throughout on its face. If, then, this be a false sense, it must be regarded not only as an enigma, but an enigma whose enigmatical character no one could perceive until the solution came; whose function, meanwhile, should be to mislead and deceive upon those very points where it was meant to instruct. The mere statement of such a conclusion is a sufficient refutation of the premises on which it rests. We conclude, therefore, that the true meaning of the narrative must be that which those would have assigned to it for whom it was first written. And inasmuch as these were altogether independent of, and unbiassed by, the discoveries of modern science, so also must our interpretation be. By this proposition, then, we sweep away all theories which would give a forced or unnatural meaning to the language of Genesis, in order to bring it into accordance with science.

2. *The Biblical cosmogony was intended for no one single nation or place, but for the whole world.*—This is evident from the fact that similar cosmogonies—some, indeed, grievously distorted, and all markedly inferior in simple sublimity—are found among many other ancient nations also. The partial, fragmentary character of most of these, as well as the notable differences existing between them, and other circumstances, preclude the idea that they are the result of later borrowings from the Hebrew Scriptures. Rather must all alike be re-

garded as diversified descendants of a common and exceedingly ancient stock ; in one, as we believe, preserved in all its primeval purity ; in the others, more or less lost, degenerated, and mixed up with heathen mythology. The wide range of these traditions—stretching, as they do, from India, Persia, and Chaldea, on the one hand, to Etruria, Greece, Egypt, and Phœnicia, on the other ; perhaps to be found even in ancient Mexico, in China, and among Scandinavian tribes—the wide range of these traditions sufficiently evidences the extreme antiquity of their source. If, then, the Biblical cosmogony be, as it implicitly claims to be, a Divine revelation, it clearly must have been one intended for mankind generally, given before the dispersion, and of equal value in every part of the world. By this proposition, then, we dispose of all theories which would limit the creation spoken of to a particular portion of the earth's surface, or would confine the significance of its form—the six days' work and seventh day's rest—to the Jewish Sabbath. Everywhere, and at every time, must its statements hold good and be of force, if its Divine origin is to be maintained.

3. *The Biblical cosmogony was intended to exhibit, through the medium of facts in creation, the relation of God to Nature, and Nature to God.*—The most cursory inspection of the narrative is sufficient to show this. From first to last every item of information is linked to some act of Deity. It is God who creates, God who commands, God who names, God who arranges, God who approves, God who blesses. Principles of natural theology, embodied in the work of creation, rather than mere facts of natural science, are the things mainly intended to be taught. True, the facts are there also, occupying a prominent position as the proper vehicles for conveying the truths in view ; but, just because vehicles, subordinate, having no intrinsic importance, but one strictly dependent on the use to which they are put. By this proposition, then, we exclude all theories which would import a distinctly scientific, rather than theological, significance to the narrative of Genesis, or which profess to find in it anticipations of scientific discoveries, having no very close connection with theological truth. To have introduced such would have been altogether inconsistent with the purpose of the cosmogony.

These propositions are of value, not only as excluding and disposing of the vast mass of unsound theories with which the Biblical cosmogony has been obscured, but also as showing what amount and kind of scientific teaching we have a right to expect from it.

Thus, in the first place, we have plainly no right to expect

scientific language, since this, to people unacquainted with science, would have been unintelligible and misleading. Scientific language, moreover, is subject to serious modifications, if not radical alterations, as science progresses; while the narrative of Genesis was intended, as we have seen, for all time, and therefore must be couched in language not liable to such changes. The only language which possesses these two requisites of general intelligibility and non-liability to change, is the language of appearances. The facts set forth must be described as they would have seemed to be to the eye of man; that is, in a word, phenomenally, or the cosmogony would fail in its purpose. All scrutiny or objection in the matter of unscientific, or scientifically inaccurate language, then, must be put on one side at starting, as altogether irrelevant. The only thing that we have a right to demand of the cosmogony scientifically, is that the facts it asserts should be really facts, described in language phenomenally correct.

Then, secondly, we have no right to expect more of nature to be treated of than was naturally known to men. The aim of the narrative was not to enlarge men's views of nature as such, but, through nature, to teach them concerning nature's God. Since, now, this was to be done independently of science and scientific discoveries, it was plainly essential that only those parts of nature should be touched upon with which unscientific men everywhere were sure to be acquainted. To have introduced anything beyond this would have required as a preliminary some amount of strictly scientific teaching, to make the subjects sufficiently familiar to be thus adopted as vehicles for conveying theological truth. But such scientific teaching is not pre-supposed; while, to include it in the cosmogony would have been wholly inconsistent with its design. We conclude, therefore, that the only parts of nature which we have any right to expect to find treated of in the Biblical cosmogony, are those ordinarily known and familiar to the human race.

Lastly, in dealing with these well-known parts and aspects of nature, we have no right to expect any scientific information from the cosmogony, except in respect to points of theological importance. Matters of pure science we should expect to find avoided rather than dwelt on, because irrelevant to the proper end in view. It cannot be too often insisted on that the Biblical cosmogony was never intended to be a manual of natural science, but only of natural theology. All objections, therefore, on the score of partial or deficient views of nature, should be met at once with the frank admission that such exactly was what we had every reason to expect. The only thing that can be demanded under this head is, that the

facts in regard to nature which *are* alleged should be scientifically irreproachable. That there are not more facts is no valid objection.

A moment's glance at the details of the cosmogony is sufficient to show how exactly these anticipations are realized. Take a couple of examples by way of illustration. Among the natural objects finding place in the history of creation are, of necessity, the celestial bodies—sun, moon, and stars. In what aspect are these regarded? Exclusively in their relation to the earth, as luminaries. Nothing else is said of them, or hinted concerning them. And why? Plainly, because thus only were they familiarly known to those for whom the narrative was intended. It was no part of the design of the cosmogony to teach men more about the sun, moon, and stars scientifically, than they already knew; but only to determine the relation of these bodies to God, that so men, in beholding them, and enjoying the benefits they conferred, might learn from them certain lessons in natural theology. Within the limits of men's ordinary views concerning these heavenly bodies, then, does the cosmogony necessarily move. So, once more, the narrative treats of the various living things inhabiting the earth. How does it denote them? Precisely according to those natural divisions which, without making the slightest claim to scientific character, are familiar to everybody. The "sprouting things" or plants, are divided into "herbs" and "trees"; the inhabitants of the waters into "swarming things" and "monsters"; the terrestrial animals into "cattle," "wild beasts," and "creeping things." Not the slightest pretence to scientific classification anywhere, but simply the natural groups into which living things would be sure to fall in the human mind everywhere, and throughout all time. To teach zoology or botany was no object of the cosmogony, but only to exhibit the position and relations of plants and animals as creatures of the one true God. To have introduced scientific ideas here would have been altogether beside the mark.

To all such limited and non-scientific views, then, Science is wholly incompetent to make objection, since, so far as they go, they are plainly correct enough; while that the cosmogony goes no further is attributable to the close and exclusive attention everywhere bestowed upon its proper aim.

By these preliminary remarks, the field of inquiry before us has been very materially narrowed, the points of contact between science and Genesis much diminished in number, a large proportion of the matter ordinarily brought into the discussion rejected as irrelevant. Still, however, some points

of contact remain, and these of great importance. To their consideration we now proceed.

Our inquiry may be conveniently divided into two heads.

1. What are the principles of natural theology enunciated in the cosmogony, and how do they agree with those deducible from independent scientific investigation? 2. What are the facts in creation alleged in connexion with these principles, and how do they agree with those discovered by natural science?

First, then, of the principles of natural theology taught, for the sake of which, we conceive, the entire cosmogony was constructed. They may be briefly summed up as six. 1. The dependence of all things upon God. 2. God's independence of His creatures. 3. God's government by fixed law. 4. God's method of gradual development. 5. God's principle of subordination. 6. God's rest.

1. *The dependence of all things upon God.*—Each stage of progress, from the first calling into existence of the heavens and the earth, to the minutest detail in the process of furnishing and perfecting the latter, is exhibited as depending directly upon an act of God as its originative cause. In some cases, indeed, natural materials, and possibly natural forces also, are spoken of as taking part, as in the generation of plants and animals from the earth, or fishes from the sea, which are described as "the earth sprouting forth sprouts," "the sea swarming forth swarms," "the earth bringing forth beasts." Still, even here the relation of all to God as their sole proper cause, is carefully maintained; for not only do they arise at His word, but before any life arises there has been in the first place a "hovering" (equivalent, probably, in idea to "brooding") of His Spirit over the empty and desolate abyss of the primeval waters. This, then, is the first and fundamental doctrine of the Biblical cosmogony. There is but one First Cause, to Whom every step of creation from first to last is to be ascribed. What has Science to say to this?

Positively, Science can simply say nothing. The instruments of investigation at her command are wholly inadequate to discern the spiritual cause asserted by the Bible to lie behind all natural phenomena. She deals exclusively with the actual now in existence, and however keenly she may examine this, however thoroughly she may understand its constitution and powers, nay, however perfectly she may even trace its historical development in the past, or predict, if it may be, its future destiny, still of the *origin* of this actual world of existence, either in respect to the matter composing it or the forces enduing it, Science

knows, and can know, nothing. The most advanced scientific generalization yet put forth—the doctrine of continuity—fails confessedly to touch this great question of origin. It may be pushed back so far as to be for a time lost sight of, but it is not solved, and ever and anon springs up again, the greatest problem of all, which Science would most delight to unravel, yet before which she stands ever hopelessly silent and baffled.

Science knows nothing of the destruction of matter or force; she knows equally nothing of their creation:—the dogma is often hurled in our teeth as if it involved the disproof of the possibility of either. Yet, in truth, it is a dogma essentially harmonious with the belief in creation as taught by Scripture. Could Science point to physical origination as a possibility, either in matter or force, the necessity for referring these to a spiritual cause would be at an end; the fundamental doctrine of the dependence of all things on God would be shaken well-nigh to overthrow. But she cannot. It is admitted that there is not in all the world of nature which Science has examined any power or principle capable of creating. The Biblical doctrine remains, then, not only untouched, but confirmed and supported by the negative testimony of Science.

2. *God's independence of His creatures.*—Most carefully is this complementary truth set forth in the cosmogony. It is not enough to say that God created each successive member of the universe; but having created, He “beholds” them, approves of them, gives them “names;” thus implying in the most forcible way their absolute distinctness from Himself. In respect to life, where confusion between creature and Creator was most liable to occur, the narrative is especially guarded. All such ideas as emanation, all pantheistic notions of the one Divine Life appearing under diverse forms in every variety of creature, are forbidden at once by the terms of the narrative:—“the earth brought forth,” “the waters brought forth,” not “God brought forth.” While with respect to man, not even the expression of the second chapter (added by a later hand) of God “breathing into his nostrils the breath of life,” is tolerated; but it is strictly “in God’s image,” “after His likeness”—resemblance of nature merely, not participation. To Israel, where God’s personality was sufficiently guarded in other ways, the intimate connexion of man’s life with God’s might be freely, because safely, spoken of. But for the world at large God’s absolute independence of all other life or existence must be strenuously insisted on in every particular.

The entire agreement of Science with Scripture on this

head has been already implied in our remarks on the preceding one. Science recognises and avows that in no created things, either animate or inanimate, is there to be found any force or influence, latent or active, which can account for their primal origin. In other words, the energy and life of Nature is not a creating power, but a created. Even in the wildest theories as to the origin of life, where the vital principle is held to be a mere modification of physical force, the admission is made, however unnoticed or concealed, that life also is not a self-originated power; for does not Science perpetually proclaim that of the creation of such force she knows nothing?—that there is no physical cause, either in itself or elsewhere, to which it can be ascribed? The creature in all its parts, then,—matter, force, and life,—is admitted to be independent of, and different in nature from, its Creator. Pantheism and Atheism are alike alien to Science, so as Science be but heard impartially and fully.

3. *God's government by fixed law.*—This appears in the cosmogony in many ways. Thus, in the first place, every creative act is accomplished by word of command: God says, "Let it be," and it is. Then, again, there is the still more important point of the assignment to each element in creation of its particular province and work: the light shall "divide day from night;" the expanse shall "separate waters above from waters below;" the luminaries shall be "for signs and for seasons, and for days and for years;" the herbs shall be "for food" to man and beast. The same idea appears in another form in the *names* which are given to certain members of the universe, designating their place and function—"day," "night," "heaven," "earth," "seas." In yet other cases special commissions are given; as, to the animals, "Be fruitful and multiply;" and to man, in addition, "Subdue and have dominion." Nothing is left to adjust itself, or even find out its proper office, but all is arranged beforehand by the great Designer. And this arrangement is fixed and immutable. For all time, as much as for the present, everything is subject to law. "He commanded, and they were created; He hath also established them for ever and ever; He hath given a decree, and it shall not pass."

How completely Science is in accordance with Scripture on this point it is unnecessary to insist on at any length. The reign of law throughout every department of Nature is the best established of all the larger generalizations of science. And this in both the particulars implied in the Biblical doctrine;—(1) the existence of a distinct function and purpose in every created thing, to which its constitution and properties

are exactly adapted ; and (2) the stability and invariableness with which the laws governing all things are maintained. It is impossible to imagine two testimonies more absolutely agreed than are the voices of Scripture and Science on these points.

4. *God's method of gradual development.*—He does not create a perfect universe at once, but slowly builds it up step by step. As He first creates it "the earth is empty and desolate," and only at the close of a whole week of progress does it become fully ordered and peopled after God's mind. Nor is this all. At every stage of the work God surveys the steps already taken, and pronounces them "good." It may seem strange to say so. What good, men might say, is the light with no eye to see it? What good is the sea, or the dry land, or the expanse, with none to inhabit them? What good are the plants, with none to use them? But God thinks differently. To Him, who foresees and designs their purpose, they are "good" already. His plan is perfect, and each element in it also perfect in its kind. But He is in no hurry to carry it out all at once, so that its perfection may be seen, but will rather develop it slowly and in order.

It needs but few words to point out the concurrent witness of Science on this head also. The whole science of geology,—what is it but one overwhelming testimony to the fact that the furnishing and perfecting of the earth has been a gradual process, not accomplished all at once, but slowly, step by step? The same principle has of late been applied to another department of Science, and the multiplication of species both of plants and animals has been ascribed to a similar process of gradual development. To cite this example as established Science would be certainly premature. It is only mentioned here to show how fully the *principle* set forth in Genesis is recognized by the most advanced leaders of Science as a true one in regard to the order and manner of creation.

5. *God's principle of subordination.*—Not only are there successive stages of creation, not only successive additions to the sum of being; but each stage, each addition, is necessary for that which is to follow, and is introduced in preparation for it. This is very beautifully and subtly expressed in the arrangement of the work under the six days. Attentively considered, these six days are found to fall into two corresponding and parallel halves, the first, second, and third answering severally to the fourth, fifth, and sixth. Thus on the first day, light is called forth; on the fourth day, luminaries or light-bearers. On the second day, the expanse is formed, and the waters divided; on the fifth day, expanse and waters are peopled with appropriate creatures. On the

third day, the dry land appears and is clothed with vegetation ; on the sixth day, beasts and man are made to dwell on the land, and consume the vegetation. In this way the universe is made to appear, both in past and present, as an organized whole, in which every member depends upon those below, and has obligations to those above. While the crowning point being plainly man, to whom dominion over the whole is given, —man, however, as God's representative—the grand truth at once beams forth, that man's office and obligation is to use and govern all things in subordination to his Maker ; and hence, that faithful occupation, not selfish enjoyment, is his part and mission on the earth.

Once more it is an easy task to show the harmony of Science. How marvellously has Science exhibited the intricate web of mutual dependence which links together being with being, member with member, so that none can exist and flourish without the other, and each by filling its own place, and obtaining that which itself wants, at the same time ministers to and supports others ! While for the crowning feature of all, what truth has Science more repeatedly and emphatically enforced than this—that all things in the earth are under the dominion and for the use of man ? These things are too familiar to need insisting on. We pass therefore to the last item in our list.

6. *God's rest.*—The work of creation is not carried on continuously, nor is it carried on for ever,—there are pauses, and there is a final rest. At the founding of the earth the "morning stars sing together," light dawns upon the empty waste of waters, brooded over by the Breath of God, and rapturous expectation might anticipate a speedy development of life and order. But no, there comes "evening ;" the work is suspended ; and not until "morning" also comes, closing the first day by ushering in a second, is the work resumed. Creation is advanced another stage, then another pause ensues ; again "evening" comes, and again "morning" comes, before the third day's work begins.* So it goes on until

* This would seem to be the true meaning of the six times reiterated clause, "And there was evening and there was morning." The A.V., indeed, by its mistranslation "the evening and the morning were," &c. represents these as *constituting* the day just described ; which, however, makes their mention meaningless and inexplicable, and would also require, if true, not "evening and morning," but "night and day." The only place in Scripture where evening and morning appear to be spoken of as making up the whole day is Dan. viii. 14, where, however, the reference is not to days simply, but to the daily sacrifice, which was offered every evening and morning. To say that sacrifice should be suspended for 2,300 "evening-mornings" was hence a natural

the end, when in addition to the nightly pause there comes a whole day's rest, holy and blessed. What meaning now are we to assign to these successive rests? That they are introduced merely as a sort of framework to the narrative, is an idea so utterly inconsistent with the dignity of the cosmogony that it may be set aside at once. Like every other detail, they must be regarded as the embodiments and visible manifestations of principles of natural theology. Nor when we examine them carefully is there much difficulty in discerning what these underlying principles are, for the sake of which they were introduced. These rests express, in fact, the results now apparent in nature of those principles of creation already considered—independence, government by law, gradual development, and subordination. Thus, first, of independence. The act of creation is an act done once for all; the creature once made, though still in a certain sense dependent, yet exists henceforth quite distinct from its Creator. But, secondly, mere existence is not all. Every creature has besides some work assigned to it, to ensure the performance of which a law has been imposed upon it, to be observed not now only, but always; to which also all its parts and faculties are exactly adapted. Creation, then, once accomplished, the law once given, and the Creator not only may, but plainly must, so far as that item of His work is concerned, *rest*. As Ruler and Governor He doubtless works always, but as Creator—the only view of God here regarded—His work is of such a character that He works once only, and then rests. This is the fundamental idea to be set forth. Since now, thirdly, it is a principle of Divine action to create gradually, step by step, it follows at once that each of these steps of creation must be succeeded by a corresponding rest. To represent which idea adequately it was manifestly necessary that as there were six stages of progress, six days of work, so there should be also six pauses, six

expression for 2,300 days. But no such explanation manifestly can be given for the use of such a periphrasis here in Genesis. The main points to be observed, however, as decisive of the whole question, are (1) that the verb is invariably inserted *twice*—"there was evening, and there was morning; a second day," &c.; and (2) that this verb is the very same, and in precisely the same form (יָרָא) as is used throughout the chapter to describe the successive events of creation. "There was light" and "there was evening" are precisely parallel expressions; and just as the first requires us to regard the light as coming *after* the command which called it forth, so does the second require us to regard the evening as coming after the light, the morning after the evening, and the day therefore as not complete until both evening and morning had thus *succeeded* the creative acts previously described. Nothing but a nightly rest, then, bounded in this way by evening and morning, will satisfy the plain requirements of the language.

nights of rest. Since, lastly, it is the crowning principle of all to subordinate member to member in such a manner that to man shall be committed the dominion of the earth and all things in it, it follows that directly this system of organization is complete there succeeds not only the proper rest consequent upon the particular act of creation last accomplished, but also a final and lasting rest belonging to the whole—an idea represented in the cosmogony by the Sabbath, a day on which no work is done, because all is finished and complete. This seventh day is pronounced to be blessed and holy, because in it God rests from all His work. A most important point. For, observe, God does not rest because the day is holy, but the day is holy because in it God rests. It is the peculiar character of the rest that makes the day blessed. And what is the peculiarity of this rest? It is a rest, not only from work ended, as before, but from work perfected, from work so perfected as to need no further addition or interference from the worker's hand. Since, now, such perfect work belongs in native right to God only, and none else, so the rest which that perfection brings is also His peculiarly, and is hence fitly called holy and blessed,—holy and blessed just because it is Divine,—the perfect rest resulting from perfect labour.

It would be an interesting task to examine how this view of the Sabbath of creation explains its use as the type and model of the Sabbath of men, both on earth and in heaven. The subject could scarcely, however, be considered relevant to the present paper. We pass it over, therefore, to inquire once more, what has Science to say to this principle of natural theology, enunciated in the Biblical cosmogony?

The fact of God being at the present time resting from creation, is one to which Science abundantly testifies. Minutely as she may examine Nature, whether animate or inanimate, no trace of creation as a process now going on can she anywhere detect. Changes, transformations, developments, reproductions, there may be in abundance, but no creation. Creative force is not now in action. It can only be inferred from its results. No other token of its existence is perceptible. The Creator is resting. Nor does Science stop here, but boldly comes forward with a reason for this inactivity. There is no need for creative power, for all things in the universe are so constituted, so governed by law, so fitted into one another, that by mutual action and reaction the whole machinery of the world is kept in unceasing motion, self-guided, self-adjusted, self-energised. The wonderful spectacle thus presented has afforded a pretext to some to deny that there is any Creator at all. The world exists and

goes on without one,—why may it not always have done so? Neither the question thus put, nor the answer by which it must be met, are properly any part of demonstrative science, and need not therefore be here discussed. Two remarks only shall be made. First, in the analogical case of man's works the principle here contended for certainly does not hold good. A watch is a wonderful piece of mechanism, but it requires constantly winding up. Could man make a watch that should be ever winding itself up as fast as it ran down, would this be considered an article *less* evidently the result of skilled workmanship than an ordinary dial? Would it not rather be considered to involve proof of far greater and more perfect skill? Just so the universe, ever returning on and sustaining itself, is intuitively felt to be a greater evidence of creative power and wisdom than it would have been if so constituted as perpetually to need its Creator's interfering hand to keep it in action. Secondly, had the case been indeed thus, and the world been less self-reliant than it is, the doctrine of the cosmogony would have been proved false; for the rest into which God entered at the close of creation would have been shown to be not final, not lasting, not perfect. As it is, Science in this very doctrine, which has been hailed by some as getting rid of the Creator altogether, has but borne a powerful, though unknowing testimony, to the Scriptural truth of the perfection of that creation which such have thought to ignore. God has rested from His work and does rest, and His rest is not only the cessation from labour ended, but the satisfied beholding of a perfected design; a sabbatical rest, holy and blessed.

It is needless to summarize the results of this comparison in respect to principles. The absolute concord of Science and Scripture throughout has been too self-evident to require insisting on. We proceed, therefore, at once to the second division of the subject—the *facts* in creation alleged in connexion with these principles, and their agreement with those discovered by natural science.

Here especially is it necessary to bear in mind the warning given at starting, to distinguish between scientific conclusions based upon facts, and scientific theories, since it is with the former only that the statements of Genesis can fairly be compared. We shall consider—1st, a few detailed facts asserted in the cosmogony; 2nd, the *order* of creation there set forth; 3rd, the *time* of creation; concluding, 4th, with a few remarks on its testimony as to the *manner* of creation.

1st. *The detailed facts.*—But few of these come in contact with science, owing to the principles on which the cosmogony

is constructed (see p. 342). Two may, however, be mentioned as presenting points of some interest.

(a) It is asserted in Genesis that the whole earth was originally covered with water, and that out of this water the dry land made its appearance. To say that Science has absolutely endorsed this statement would perhaps be too bold an assertion; but, so far as she is in a position to give judgment on the point, the evidence of geology certainly tends very strongly in that direction. The vast majority of existing rocks have unquestionably been formed under the sea, which has consequently, at one time or another, covered nearly, if not all, the surface of the earth. That the whole was originally under water is a proposition, then, at all events very accordant with the analogies and spirit of geological science.

(b) It is asserted in Genesis that there exists an "expanse" above the earth, which divides the waters below from the waters above. This statement has been much criticised: first, on the ground that the expanse is described as something solid, which the air or sky is not; secondly, on the ground that there are no such waters above it as are alleged. For the first point, it suffices to say that it is admitted by all competent scholars that the Hebrew *רָקִיעַ* does not signify anything massive, but, on the contrary, something which is stretched or beaten out. While, for the quality of strength, which is in some places ascribed to it, and mistaken by sceptics for solidity, *this* the atmosphere certainly has, or it could not bear up the clouds, and resist the course of projectiles, &c., as it does. The second point is one which must detain us for a moment, as the answer in this case is purely scientific, and not by any means so familiarly known as it ought to be. It is asserted that the presence of clouds in the upper regions, separated, as they undoubtedly are, from the terrestrial waters by the intervening air, is insufficient to justify the language of Genesis, which requires a quantity of water, generally diffused over the upper part of the expanse. For the sake of argument merely, we will grant that the clouds are not sufficient, and proceed to demonstrate the existence of other waters also, universally diffused in the manner described.

It is a fundamental principle in optics that light can only travel in straight lines. The light which reaches our eyes, then, when we look upwards at the sky, has travelled to us straight from the sky at which we look.* Now, whichever part of the sky we look at, whether near the sun or far away

* The minute refraction arising from passage through the atmosphere, is omitted as too trivial to affect the argument.

from it, we still see this light; it is diffused everywhere. Whence has the sky this light? Undoubtedly from the sun. Yet it is not the direct rays emanating from the sun which we behold, for we see it equally when the sun is out of sight, and in directions altogether different from the path of its beams. In what manner, then, has the sky become possessed of this power of diffusing the sun's light? It certainly does not come from the clouds, for the phenomenon is as noticeable on a cloudless day as at any time. It has its origin, moreover, above the clouds, since, if the clouds be thin enough, this luminous sky can invariably be seen through them. How comes it then? The only power with which we are acquainted which can thus diffuse light is *reflection*. There must be a quantity of reflecting matter in the upper regions of the atmosphere. But, then, for matter to be able thus to reflect, it must be either liquid or solid. What matter, then, is there which can exist in these regions thus diffused in a liquid or solid state? The only matter that we can conceive is water. We know that large quantities of water are constantly being carried into the air as vapour; we know that it condenses as it rises, owing to the diminished pressure and consequent fall in temperature; we know that it forms clouds, and into clouds the whole of this condensed water has generally been considered to be gathered. It would seem, however, that this is not the case, but that some of the vapour rising above the cloud region becomes condensed there in a far looser form, and there acts as the great diffusing agent of the sun's light. It is an interesting confirmation of this explanation, that the light from the open sky referred to is invariably found to be more or less polarized, as it inevitably would be by reiterated reflection from the surfaces of minute globules of water.

Thus in the most literal and extended sense is the statement of Genesis shown to be true, that there are waters above the expanse as well as below, both gathered into clouds and diffused over the whole atmosphere.*

2nd. *The order of creation*.—Here several points present themselves for notice, which will require careful consideration. The order of creation is known to Science in two ways—(1) from observations of the necessary relation in which different

* It was, of course, no part of the design of the cosmogony to teach this fact in meteorology. The natural fact known to all men, which this part of the narrative takes into account, was undoubtedly the existence of *clouds*. The case is one of those often-occurring ones, where a deeper meaning lies in inspired language than at first sight appears—a meaning not perhaps essential to the significance of the passage, yet whose discovery enhances its significance very wonderfully.

members of the universe stand to one another, which involves that some must have been in existence before others; (2) from the order in which living beings make their appearance in geological strata. Of which the former may be regarded as a certain ground of argument; the latter as an uncertainty. The several items of information contained in the cosmogony will be reviewed according as they fall under the one or other of these heads.

(1.) The narrative places "light" as the first thing called forth by God in the process of transforming the waste and desolate abyss into the perfected earth. By this "light" we are certainly not to understand light in its narrower technical sense, as distinguished from heat, but rather the two in combination as we meet with them in nature in the light of the sun.* The creation of "light" must be taken, therefore, as equivalent to what we should now call the creation of radiant force. Now, what is the teaching of Science on this point? It has shown us most abundantly that on such radiant force, imparted to the earth by the sun, and by the earth once more scattered into space, depends in the first place well nigh the whole of the phenomena of meteorology. That it is the cause not only, as we readily perceive, of the temperature of the earth, but also of the moistness of the atmosphere, of winds, of clouds, of dew, of rain, of ocean currents,—in a word, of every one of the elements which, variously combined and conditioned by the earth's external features, go to make up climate. Further, that on this climate, so produced, very many of these same external features themselves not a little depend; the action of rain and its consequent rivers, of winds, and ocean currents, being in particular largely instrumental in actually altering the surface of the earth. Once more, that this radiant force supplies the physical power needed for the life and growth of plants, and through them indirectly of animals also; so that without it there could exist no life upon the earth at all. Next, therefore, to the materials of which the earth is composed, there is no element in its constitution of such paramount and extensive importance as "light;" while, from the relation in which it stands towards other parts of creation, it plainly must have preceded them in order, since without it they could not be. Before there could be expanse or clouds, plants or animals, there must be light. So Science teaches,

* How closely the ideas of light and heat were united in the Hebrew mind is shown by the same word being used for both, with merely a slight difference in pronunciation, *אור* and *חום*.

and so Scripture also lays down the order of creation ; first, the materials ; then, as the first step in developing and arranging, " Let there be light."

Among living things, the narrative of Genesis places plants before animals. Here, again, it is plain that Science is perfectly agreed. The food of animals is derived entirely from the vegetable world ; by some directly, by others (the carnivora) indirectly, through the consumption of those who have fed upon the plants. The power, from the simpler substances, as carbonic acid, water, and ammonia, to build up the more complex organic bodies ; the power to render latent in such compounds the heat-force derived from the sun ; these alike appear to be peculiar properties of the plant. The animal can only break up and take down, more or less completely, that which the plant has put together ; can only let out and use the force which the plant has stored up. In the order of creation, then, the plant must have come before the animal, since without it the animal could not exist.

(2.) Passing over the point already touched upon, of the precedence of water to land (p. 351), we notice that in Genesis the animals do not all appear at once, but on two consecutive days, the fifth being occupied with those that inhabit the waters and the air, the sixth with those on the land ; viz., first, animals, and, last of all, man. So far as Geology is able to give judgment on this point, her testimony is in accordance with Scripture, the remains of man being confined to the very newest strata, land animals stretching much further back, birds it would seem further still, and inhabitants of the waters certainly furthest back of all. If these successive formations of rock do, as many think, correspond to the gradually-progressive creation described in Genesis, we have certainly here a remarkable parallelism. It would be, however, most hazardous to insist upon it strongly, not only from our imperfect acquaintance with the contents of geological strata all over the world, but especially from the fact that a vast majority of these strata were, as already remarked, formed in the sea, and therefore could only be expected to contain the remains of aquatic creatures, though there may have been contemporaneous land ones also, unknown to us simply because their remains had no such opportunity of being preserved. To lay any stress upon the parallelism under such circumstances would be both unwise and unscientific.

The confirmations of the cosmogony which have been drawn from various popular theories of the past history of the earth, and especially the nebular, in this matter of order, we pass over, as altogether beside the limits laid down for the

discussion at starting. For the like reason, it is unnecessary to say anything upon the purely hypothetical objection as to the creation of light, the expanse, the dry land, and the plants, *before* the celestial bodies. Science knows nothing of the past history of these latter, nor even of any epoch beyond the history of man when their existence can be certainly demonstrated. That there was light in the pre-human ages, is, no doubt, most fully proved; that there was day and night and seasons, is extremely probable; but that these necessitate the existence of the sun, moon, and stars which we now see, this we have yet to learn.

3rd. *The time of creation.*—Here we are brought face to face with the greatest of all the difficulties which beset our subject; difficulties which it is hopeless to attempt to solve without in the first place clearing away the conflicting exegetical theories which have been their principal cause. Two questions have to be answered:—(1) Do the six days spoken of embrace the whole history of creation, or only its latest stage? (2) Is the word “day” to be taken in its ordinary sense, or otherwise? To an unprejudiced reader of Genesis, knowing nothing of modern controversy, both questions would seem to be so trite and simple as not to require a moment’s consideration. The former alternative in both instances appears the only one tenable for a moment. Not thus lightly, however, can we venture to dismiss their discussion. However decisive may be the verdict of such an unbiassed mind, there has been too much ingenuity expended on behalf of the contrary opinions to allow us to rest on common sense merely as a sufficient ground for their rejection. We must examine the evidence in detail.

First, then, of the question, Do the six days embrace the whole of creation, or only part? No one will dispute that the cosmogony as a whole embraces the entire history of creation. Its opening clause—“In the beginning God created the heavens and the earth;” and its closing subscription—“These are the generations of the heavens and the earth in their creation,”—are alike conclusive on this point. At the close of this whole work of creation, then, we find the sabbath of rest. This sabbath, we are repeatedly told, was a rest from *all* God’s work,—“Thus the heavens and the earth were finished, and *all* their host. And on the seventh day God ended His work which He made; and He rested on the seventh day from *all* His work which He made. And God blessed the seventh day, and hallowed it; because that in it He rested from *all* His work which God, by making, created.” The stress upon the “*all*” here is unmistakeable. But the seventh day’s rest

being thus a rest from *all* the work of creation ; to suppose, as some have done, that the preceding six days, where the gradual process of creation is described, include but a portion, and that a very small portion, of creative work, is plainly to destroy the proportion and symmetry of the narrative altogether. God's sabbath, on this view, becomes a sabbath not after six days' work, as the narrative distinctly implies, but after six days' work and a great deal more, of which great-deal-more the narrative makes simply no mention and gives no hint whatever !

But at least, it is said, there is a point in the narrative where the earlier stages of creation can without difficulty be slipped in ; an indefinite blank space between the first and second verses, which the interpreter can fill up at pleasure. But what we want to know is, not how it is possible to fill in such earlier stages without doing violence to the context, but what reason there is for imagining such stages to exist at all ? To point to scientific discoveries as the reason, is beside the mark, since it has been already shown that all honest interpretation of this chapter must be independent of Science. If it be admitted that Science has cast such a new light upon the history of creation as to make the natural significance of the six days' work, as all-embracing, untenable ; and a new interpretation is required, altogether alien to the spirit of the cosmogony ; a blow has been struck at the authority and divinity of the latter even more formidable than direct rejection, for it has come from friends, not foes. And whereas also the bolder course of rejection ascribes no more than ignorance to the author of the narrative, the weaker one of altered interpretation in effect asserts his *cunning*, in so framing his account as that, while bearing one meaning plainly on the face, there should still be a loophole for escape in case facts should eventually prove that natural meaning to be a false one.*

But what, after all, are the facts with regard to this imaginary space, of indefinite dimensions, between the first and second verses ? 1st. The state of the earth described in the second verse is distinctly spoken of as a condition in which

* It has not been lost sight of in thus speaking that there were some who, before the discoveries of Geology, held a similar view in regard to a space between the first and second verses. But whence did this idea originate ? Simply in the difficulty where else in the cosmogony to place the creation and fall of angels. The *principle*, therefore, on which these ancient interpreters acted was the very same as that of their modern followers—the solution of imaginary difficulties by ignoring the natural meaning of the text and introducing ideas altogether out of harmony with its structure.

the earth *existed*, not into which it *passed*. True, the same verb (יָרָא) is used here which elsewhere throughout the chapter undoubtedly signifies succession or becoming (see note, p. 347); but then it is used in a totally different form and construction (יָרָא not יָרָא), such as is *not* elsewhere used to express succession or becoming, but rather existence or state. So far, therefore, from the text countenancing the idea of the chaotic condition of the earth being subsequent to its original creation, it rather, by rejecting the form of the verb which would have naturally expressed this, and adopting another, distinctly discountenances it. 2nd. No one who attentively reads the description itself can fail to see that in every particular it has reference to what is to follow, not to anything that may possibly have gone before. Thus "empty and desolate" is contrasted with the fulness and order about to come "darkness" with the light, "the deep" with the divided waters and dry land; while the "hovering" of "the Spirit of God" is the natural preliminary to the creation of life. Of any previous order, fulness, light, or land, we read nothing. Lastly, on this point we have not only the clear language of Genesis, but the if possible still more conclusive words in the fourth commandment, whose importance as an authoritative re-statement of the main outlines of the cosmogony none will dispute. Here it is stated categorically, "In six days Jehovah made the heavens and the earth, the sea and all that is in them" (Ex. xx. 11); and, again, "In six days Jehovah made the heavens and the earth" (Ex. xxxi. 17). Anything more precise than this can hardly be imagined. This point being settled, then, we turn—

Secondly, to the question, Is the word "day" to be taken here in its ordinary sense, or otherwise? If the word "day" be used of a period of time, we find in Scripture, as everywhere else, but two meanings which can be assigned to it—a period of twenty-four hours, or a period of twelve. True, occasionally in prophecy days are made the symbols of longer periods, as years (e. g. Ezek. iv. 4-6); but this in no way affects the question at issue, since (1) the natural sense of "day" is *not* even here in the least put aside, but merely used as a type or emblem of something else; and (2) the cosmogony is not a symbolical prophecy, but an historical narrative. True, further, that not unfrequently "day" is used in a loose, indefinite sense, as in the phrases "day of judgment," "day of the Lord," &c. This also, however, is useless for our present purpose, since we have not here any longer or different period of duration spoken of, but rather the whole idea of duration put out of sight, and "day" used merely in the sense of epoch, as is evident from

the fact that in such expressions we can invariably substitute a general term, as "time," without in the least affecting the sense. In this way we may speak of "the day of creation," as, indeed, is done in Gen. ii. 4, v. 1; but this plainly means no more than "the time when God created," the duration of this time being wholly left out of account. But that the six days are not to be thus taken is evident,—(1) from their being successive days, following one another in an orderly and natural manner; (2) from the mention of "evening" and "morning" as the limits of the working portion of each; and (3) from their being in the fourth commandment paralleled with the days of human toil, which unquestionably are periods of definite duration, and unquestionably of twenty-four hours' length. The notion, therefore, advocated by some that the word "day" here is to be taken as intended to denote a period of long duration, must be met by the counter-assertion that nowhere in Scripture or elsewhere has the word "day" any such significance. To assume such a meaning merely to get over difficulties, is unwarrantable.

Are we, then, to conclude that it was the intention of the cosmogony to teach us that in six literal days of twenty-four hours each the whole of creation was accomplished, from beginning to end? Surely not. Such a doctrine would be wholly foreign to the spirit and design observable throughout. This may seem a somewhat paradoxical assertion, after what has just been said. A little consideration, however, will show that the paradox exists only in appearance.

These "days" spoken of are not human days, but Divine; not days of man's work, but of God's. Now, upon what principle does all Scriptural description of God's being and God's acts proceed? It is upon that of accommodation. Human members, human feelings, human actions, are freely attributed to God, though literally most incongruous, just because in no other way could the human mind grasp the reality of that which was intended. To speak under the imagery of such ideas was no doubt to speak most inadequately and inaccurately, but at least the kind of notion was engendered which was required, and it was felt as a real thing. To have spoken abstractedly might have been theoretically more correct, but it would have been practically far more inadequate and faulty, because not only would the notions conveyed have been far more misty, but especially the all-important element of reality would have been wanting. The former method, therefore, rather than the latter, is that invariably adopted (of course, carefully guarded against misconception) by Scripture. Now, what effect has this upon inter-

pretation? When we come to such expressions as "God's arm," "God's eye," "God's mouth," how do we deal with them? We assign no new sense to the words themselves; "arm" as much means arm, "eye" eye, "mouth" mouth, here as anywhere else. But we say that while the words are to be taken in their literal sense, the ideas they convey are yet not to be pressed literally, but only by way of accommodation. These terms, "arm," "eye," "mouth," are the best human representatives of the Divine realities denoted; their fitness as such representatives depending upon their relation literally to man being the same in *kind* as the relation of these Divine realities to God. So in exactly the same way we treat such statements as that "God went down to see," that "God smelled a sweet savour," or that "God repented." We do not say that "go down" means anything but go down, or "smell" anything but smell, or "repent" anything but repent. Yet we do not ascribe any one of these actions literally to God, but we assert that there were actions of God having the like relation to His nature, which these actions, taken literally, have to our nature. The natures are widely different, and therefore the parallelism must not be pressed too closely, but still it remains the truest representation of the actual verity which the imperfection of human thought will allow of.

Before proceeding to apply this principle of interpretation to the case immediately in point, it may be well to notice that it is upon this method of accommodation that the entire cosmogony is constructed. When, for example, we read there of God *speaking* in order to call things into being, we do not understand by that a literal utterance of audible words, but that the power or influence by which He created was not a physical or material one, but a spiritual or moral one, of which the fittest representative was the human word-of-command. So, when we read of His giving names, we do not take that to mean a literal bestowing of verbal titles, but a defining of character and position, answering in His sphere to what the giving of names is among men. So, once more, when we read of God's resting, whether we take this in the sense of "leaving off" (שָׁכַח Gen. ii. 2-3), of "sitting down" (יָשָׁב Ex. xx. 11), or of "taking breath" (שָׁנָה Ex. xxxi. 17), we do not understand a literal resting, but only an act which, judged by the standard of God's nature, was like what such resting is to man. The words still bear their ordinary sense, and no other, but in their application to God, they are felt to be only representatively true, not literally to be insisted on.

If, then, this be the principle on which God's acts and attributes are universally spoken of in Scripture,—if it be the principle on which the whole of this very passage is constructed,—is it not also the principle, rather than that of literal force, on which we should interpret the word “day”? Days, then, in the cosmogony, are not to be understood as literal periods of twenty-four hours each, albeit the literal sense of the *word* remains the same as ever; but as periods of such a length as, in their relation to God, occupy the same position that days do towards men. The whole work of creation is presented to man under images drawn from man's own work; the time of creation is no exception to the rule; its image is a week's work. The creation of a universe is to God no greater task, no longer or more arduous labour, than a week's work to His creature. This is the doctrine of the cosmogony in respect to time. Observe, now, how exactly it harmonizes with the whole tone and purpose of the history of creation here given.

(1.) It was laid down at starting that the true aim of the cosmogony was not to teach natural science, but natural theology; not to give new information concerning the facts and phenomena of nature as such, but to exhibit the relation in which these stood towards God. Had, now, the cosmogony informed us precisely how long creation took according to the standards of human chronology, this would have been an exception to the rule. For any absolute measure of time could only be compared with other measures known to man, among which the measure of the life of God was of course not one. The only idea of relation which such an absolute measure would give, therefore, would be its relation to human life, to human history; but of its relation to God, no idea whatever would be given, because there was no other measure in regard to God with which it could be compared. Yet the latter relation, rather than the former, was plainly that which the cosmogony must have been designed to set forth. This latter relation precisely it is which the six days, taken on the above view, indicate; and that in the most vivid and accurate form which the human mind was capable of comprehending. On this ground also, then, as well as the general principle of Scripture language, is the representative view of the six days to be infinitely preferred to the literal one.

(2.) It was further laid down at starting that the cosmogony was designed for all time and every place, and was to convey its teaching quite independently of scientific knowledge. Had, now, an absolute measure of time been given, with a variable knowledge of the work done in

it, it is plain that very different impressions would be given at different times of the proportion between this time and work, leading, of course, to different conceptions of the energy of creative power. To those who knew little of the extent of creation, the time stated might seem superfluously large, creative activity therefore small; and so a certain knowledge of science would have been indispensable to a right understanding of the teaching of the cosmogony on this point. But if the other view be adopted, and the measure of time be taken as relative and representative only, then no such knowledge is necessary. Of course, a better acquaintance with creation must enlarge our conceptions both of the work and the worker, and was meant to do so; but the character of our conception remains unaltered, the relation set forth being no longer, as before, that between so much work and so much time, but between the time spent on this work and the whole time of the worker's being.

(3.) Not only does this view leave untouched the parallelism insisted on in the fourth commandment between the days of creation and the days of man's labour, but it makes it even truer and fuller than on the literal view. "Days" are not the only things thus paralleled, but also "work" and "rest." That in the two latter items the comparison is of an accommodative character, none will deny: God's "work" is not the same thing as man's work, nor His "rest" the same as man's rest. If, then, the "days" of work and rest are yet insisted on as identical in both cases, it is plain that the parallel halts; since why, amidst such difference in the character of occupation, should the same absolute limits of time be observed by both parties? But if "days" are also representative terms, on the same scale as "work" and "rest," then the parallel is perfect, since all alike denote Divine realities, answering to human ones in precisely the same manner. As truly as God's work is similar to our work, and His rest to our rest, so are His days to our days. We can and ought to copy Him, because, although the actual character of each of these items is different in Him from what they are in us, yet the relation which each bears to the other (the essential point of the parallel) is the same.

So far, then, as the principle of the matter goes; so far as the design of the cosmogony, and its worth throughout all ages, is concerned; so far as its use in the fourth commandment bears witness, the testimony of all is strongly in favour of the representative view of "day" rather than the literal. One thing more only can be demanded before this view be finally accepted as established. If what has been urged is

sound, it ought to follow that in this representative sense was the expression actually taken by those for whom the cosmogony was originally intended, i. e., those unacquainted with and unbiassed by the discoveries of Science. Evidence that it was so taken may appear in two ways:—(i.) In general expressions indicative of the conviction that human measures of time, when predicated of God, are only representative, not literal; which testify to the familiarity of the principle in question. (ii.) In particular applications of this principle to the divisions of time named in the narrative. The cosmogony being not confined to the Hebrew race, we unhesitatingly include among our witnesses testimonies from other nations as well.

(i.) *General expressions.*—The first to be noticed is Job x. 4-5, where the inadequacy of human expressions as applied to God is strongly brought out. "Hast Thou eyes of flesh, or seest Thou as men see? Are Thy days as man's days, or Thy years as the days of man?" Here the expressions as to time are placed upon exactly the same footing as those concerning "eyes" and "seeing," which every one admits to be representative. So plainly Job also regarded "days" and "years." The same thought is expressed in another form in Psalm xc. 4—"A thousand years in Thine eyes are as yesterday when it is passed, and as a watch in the night;" and again, in 2 Peter iii. 8—"One day with the Lord is as a thousand years, and a thousand years as one day." Here the idea is not the inadequacy of human time-measures when applied to God, but the still more fundamental one of the different relation in which the same absolute measures stand when applied to God and to man; this difference being the cause of the inadequacy of which Job speaks. With such general conceptions there could be no difficulty in the way of rightly understanding the days of cosmogony. Rather we may say that, with such principles of thought firmly impressed upon their minds, it was impossible for one spiritually vigorous to take these "days" in any other than a representative sense.

(ii.) *Particular applications.*—The original form of the cosmogony having been strictly preserved among the Jews, we are obliged to look for information on this point to the traditions preserved by other nations. Of these the Chaldean, Grecian, Egyptian, and Phœnician have lost all trace of the element of time. The remaining three, the Indian, Persian, and Etruscan, all afford the clearest testimony to the way in which these "days" were understood in ancient times. The Indian has lost, indeed, the six-fold division, but still, how-

ever, speaks of "days" in regard to creation. For 360 days, or one year, it says, Brahman lay concealed within the world-egg. But what are these days? The same tradition tells us that Brahman's days are not days of twenty-four hours each, but are equal each of them to 12,000,000 years. Such was the Hindu conception of the meaning of a human measure of time as applied to God's creation. The traditions of Persia and Etruria are still more to the point, for here the partition of creation into six equal divisions of time has been preserved, as well as a general similarity in order. But what divisions? Not days, but six successive 1,000 years, each of which answers in character and scope to a day in Genesis. Nothing can be plainer than this testimony. The days of creation were felt by ancient nations, knowing nothing of geology or scientific difficulties of any kind, to be but representative terms, really indicative of far longer periods. They could only have felt this from the principle of the representative character of all human terms as applied to God having been, at least at first, so thoroughly familiar as to need no explanation to make it apparent. But if so, then doubtless after this manner were the days understood by all those for whom the cosmogony was originally designed.

It seemed necessary to go thus fully into the principle and evidence of the view here advocated, from the immense confusion of opinion which has hitherto prevailed upon this question of the time of creation, and the perpetual conflict in which what is thought by one or another to be the doctrine of the cosmogony is brought with the discoveries and conclusions of modern science. It is the old story over again,—men have put their theories in regard to Scripture in the place of its real teaching, and then are alarmed and angry to find them opposed to the plain witness of facts. The narrative has been twisted and turned, this way and that, to make it harmonize with Science, but still discord has reigned triumphant. Interpretations have been altered, Science abused, Science perverted, and still no better result. And no wonder, since all this while it was not the Bible that was clashing with Science, but the mistaken fancies of exegetical theorists. Putting these aside, and getting back at last to what has been shown to be the simple original meaning of the passage itself, what becomes of this much-vaunted contradiction between Genesis and Geology? It has dissolved into thin air, and vanished altogether. Let Science pursue her way unmolested; let her examine the records of the past, written in the rocks, with all possible assiduity; let her deduce, on purely scientific grounds, the time which these have taken in formation; let her fix, if

it may be, the precise duration of each stage of creation, the grand sum of the whole; let her make it as vast as she will,—we have nothing to fear from such researches and conclusions, but rather everything to hope. Whatever may be the result arrived at, it cannot in the least touch the doctrine of time contained in the cosmogony. This only it can do—it can, by giving us a truer, grander view both of what creation was, and in what time wrought, enhance our conception of His greatness to whom the whole vast work was but as one week's labour.

4th. It remains now only, lastly, to make a few remarks on the teaching of the cosmogony in regard to the *manner* of creation. Most of the points here to be noted have been already touched on in the earlier portions of the paper. It may be well, however, briefly to group them together so as to present in one view their scientific bearing. Creation, then, in general must be defined as a series of spiritual acts whereby new existences were called into being. The first of such acts, recorded in the first verse, was without doubt the creation of the matter of the universe; the second was the infusion in some way of living power by the Spirit of God; the third was the calling forth of radiant force; and so on. At each such stage of progress in the narrative, being a stage of creation, we are bound to regard some altogether new impulse as having been given, some new influence introduced; something done, in fact, which while potent in effect upon what was to come after, was not the result of that which had gone before, but of God's immediate spiritual action. At the same time, we are as clearly forbidden to imagine that all the effects described arose from these new impulses. Part, doubtless, in every case arose from the natural action of these elements in creation already in existence. In some instances this is distinctly stated, as in the successive stages of created life, which though called into being by special fiat, and so certainly involving some new impulse in their origination, yet are described as "brought forth" by the "earth" and "waters," thereby as clearly implying that earth and waters, as well as the new impulse, had part in their creation; while for other cases where this is not distinctly asserted, we have the general statement of Gen. ii. 3, that God's method of creation was throughout "by making;" i.e., it was a fashioning process, rather than a series of creations totally *de novo*. Keeping these two complementary truths clearly in mind, and observing the steps of progress indicated by the order and divisions of the cosmogony, and we have all that it has to tell us concerning the manner of creation. The precise measure in which the two elements referred to were respectively concerned in any par-

ticular item, is plainly an open question. We are merely required to accept both, to ignore neither.

At the present moment it cannot be said that Science is in a position to give any decisive opinion upon this great question. It is one, however, to which her thoughts and energies have already been largely directed, and will be still more largely in the future. Nor is there any doubt that the tendency of the most advanced scientific thought is strongly towards the fashioning theory rather than the creating *de novo* one. In the face of this fact, it is of the utmost importance for the advocates of the Bible to remember that Genesis presents us with both principles ever co-working together. Looking back over the whole of this paper, we may boldly say that the doctrine of the manner of creation is the only part of the field where war is possible between the Biblical cosmogony and Science. In respect to principles, in respect to detailed facts, in respect to order, in respect to time, there is peace. A better understanding on both sides has led to union where before there was hostility. This point alone remains debateable ground. The issue here, also, cannot be doubtful; but it may be retarded, as it has been most unhappily retarded in other quarters, by the ignorance, prejudice, and blindness of those who, professing to stand up for the truth, yet, by their countenance of self-invented errors, prove too often its direst enemies. May a timely warning prevent the occurrence of the like disasters in the present case.

The length to which this paper has already run renders it imperative to hasten to a close. It is impossible, however, to conclude without a few remarks on the general result at which we have arrived by the detailed comparison of Science with Scripture now completed. It is not their concord, in the particular case in point, to which we would refer: that needs no further comment. It is rather their relative spheres, their proper scope. We have seen how simply, yet how profoundly, how briefly, yet how comprehensively, the narrative of Genesis lays the foundation of all natural theology; yet withal how exceedingly sparing it is in distinctly scientific information. The contrast between this and the teaching of Science is very striking. Here, on the contrary, are detailed facts in abundance, facts of the greatest value as illustrations and confirmations of the Scriptural doctrines in all their lower and more phenomenal aspects; the clearest testimonies possible to their truth in relation to Nature. But as the doctrines take a higher flight, and rising from Nature soar ever nearer and nearer to Nature's God, the testimony of Science becomes meagre, her voice falters, grows indistinct, and soon is

altogether silent. She is of the earth, earthy; and no effort can make her rise to the heavenly. Left to herself, she is like those ancient miners so eloquently described in the book of Job (xxviii.). She has found indeed the source of silver, the place of fine gold; has drawn forth iron out of the dust, and melted brass out of the stone. She has put an end to darkness in her deep searchings of all hidden things. Far from all common paths, in ways unknown, in depths profound, she has carried on her course, turning up the earth and all earthly things as it were with fire. In her researches she has found all manner of precious gems, and won the wealthiest reward for her labours. Surpassing in keenness the eye of eagles, in strength the pride of lions, she has gone down even to the roots of mountains, has hewn paths through the solid rocks, has stayed and controlled the very springs, has brought forth the most secret things to light. It is her pride and glory thus to have done. Yet is there somewhat beyond her reach. Where is wisdom?—where shall she find that? Where is the place of understanding? She appeals to Nature, but there is no answer. Yet is it this which is of all things most to be desired. Beside this, all earthly spoils are valueless. All the rich fruits of her labours cannot equal this. Her search with all its glories has been in vain, for wisdom is still concealed from the eyes of all living. Only in death and destruction is there a whisper of another world whence wisdom may come—they have heard the sound thereof with their ears. Then steps in God. He understands, He knows; for all Nature is open to His eyes, and the work of His hands; and under Nature He can see the deep hidden wisdom which man has sought for in vain, even the testimony to Himself. He can make it known, and He does make it known; for, stooping to man, He says, “Behold, the fear of the Lord is wisdom, and to depart from evil is understanding.” The cosmogony of Genesis, standing as it does at the very head of Scripture, is the first utterance, the first syllable, as it were, of this great message, beginning as was fit with the revelation of that part of hidden wisdom which lay in “the heavens and the earth in their creation.”

On the motion of the CHAIRMAN, a vote of thanks was passed to Mr. Warrington for his valuable paper.

Rev. J. H. TRICOMB.—I have been extremely pleased with the valuable paper which we have just heard read; but there are one or two points contained in it on which I should like to offer a little criticism. The first thing that strikes me is, that I think Mr. Warrington has not distinguished with sufficient accuracy between the rest of God at the creation from His created

work, which was indeed the fulfilment of it, and the ordinary working of His providence ; for in a certain sense the Scripture teaches us that God still works. We read in the Evening Service of yesterday, in the 104th psalm, "Thou sendest forth Thy spirit, and Thou renewest the face of the earth ;" indicating a present renewing power under the action of God's providence—

The CHAIRMAN.—I think you have omitted to notice a passage where Mr. Warrington says : "As ruler and governor, God doubtless works always."

Rev. J. H. TITCOMB.—That I think puts one part of the paper in collision with another part, where we have it distinctly set forth that God has ceased altogether from all work. I was going to quote another passage from the New Testament where our Lord says, "My Father worketh hitherto and I work." But with the exception of that point, I have the greatest pleasure in expressing my approval of the paper. There are, however, one or two things which occur to me as worth adding in a supplementary fashion to Mr. Warrington's essay, as they are connected with the paper. The paper appeals principally to natural science ; but there is another science, if I may so call it,—the science of comparative mythology,—which, though not touched upon by Mr. Warrington, may, I think, be brought in in support of the argument. I refer to the evidence which we may gather from the mythological romances and from the cosmogonies of heathen nations in India, Persia, Greece, Scandinavia, and other places, as being in full harmony with the statements contained in Genesis. Mr. Warrington points out, as one of the leading features in the Mosaic cosmogony, the pause or rest which occurs at the end of each day's work in the creation. I have read that a Mr. Lord, who was in the East Indies in the course of the last century, had considerable intercourse with the Parsees, and he gathered from them a statement of their mythology in reference to the creation. Their cosmogony was after this fashion : God, the unmade and self-existent Creator, created the world in six labours ; and between each of these labours they describe Him as resting for five days. Here you have a pause between each of the six successive labours, in strict harmony with the Mosaic cosmogony, and with the line of argument in Mr. Warrington's paper. If I wanted to make you laugh, I could tell you that the same cosmogony goes on to describe how God then made a man and a woman, the latter of whom gave birth to twins every day for a thousand years, after which, the world becoming very wicked, God destroyed it by a flood—still carrying out, you see, the Mosaic narrative. Mr. Warrington notices that part of the Mosaic cosmogony from which we learn that the world was originally wholly submerged in an ocean of water—in a universal flood. Homer made Osiris, the ocean, the mother of the Gods ; and Hesiod made Chaos the father of Gods, or the first God, and Ovid follows Hesiod. I was looking at Cudworth's *Intellectual System* this morning, and I found there a quotation from a traveller in Japan of the last century, who speaks of the Sintoists, one of the oldest sects in Japan, and says they hold this idea, that at the beginning of all things chaos was placed, as fishes swim, in water ; out of which chaos came a race of men, and from which creation started. There you have a notion of the world starting its existence in water. Scan-

dinavia has been referred to as containing some evidence, though rather problematical evidence, in favour of the Scriptural narrative. I have been looking at some of my old note-books, and I find that in one of them I have gathered from one of the Icelandic Eddas, which represent the most ancient form of Scandinavian learning, the following account of creation :—

“In the day-spring of the ages there was neither earth below nor heaven above to be distinguished. The whole was one vast abyss. The sun had no palace, and the stars knew not their dwelling-place.”

The “abyss in darkness” describes chaos well, and harmonizes with the statement of Moses as to the primitive condition of the world. In India, according to the Hindoo philosophy, the Eternal Being, Brahm, after creating the world, destroyed it on several successive occasions, and reproduced it again after repeated submersions under the ocean. In the *Manava Shastra*, quoted by Sir William Jones in the *Asiatic Researches* (vol. i. p. 245), it is said :—

“The world was all darkness till the self-existent God (Brahm), making it manifest with the elements, perfectly dispelled the gloom. Desiring to raise up creatures by an emanation from his own essence, he first created the waters, and impressed them with a power of motion. By that power was produced a golden egg, blazing like a thousand stars, in which was born Brahma, the great parent of all rational beings. That divinity, having dwelt in the egg for revolving years, himself meditating on himself, divided it into two halves, from which he formed the heavens and earth, placing in the midst the subtle æther, the spirit of the world, and the permanent receptacle of the waters.”

That also harmonizes with the statement of the Mosaic narrative. The Hindoos also use their word which signifies day as expressing the same thing as our day, and yet when spoken with regard to the Creator, it expresses something totally distinct and different from it. Let me add a quotation on this point from Maurice's *History of India* :—

“A day of Brahma is a Kalpa. According to Major Wilford, there are five great Kalpas, at the end of each of which all things are annihilated, or absorbed into the essence of the Supreme Being. Every Kalpa, except the first, is preceded by a universal cataclysm of water.”

Here you have also a statement of universal deluges, or the earth entirely covered with water ; and also Mr. Warington's theory as to days is retained. The quotations I have made do, I think, harmonize with the line of thought and with the arguments which we find in Mr. Warington's paper.

REV. JOHN MANNERS.—The more we consider the matter involved in this paper the more we shall see the perfect agreement and harmony between science and that which is given to us in Genesis in reference to the creation. I should render the first verse of Genesis, “In the beginning God created the heavens and the earth,” in this way :—“By the beginning God created the heavens and the earth.” Some may ask, “But what would you make of that ?” Simply this, that it gets rid of the point of time, and would go to show that at the beginning all things were brought into

manifestation by the Word—the *λογος*, the living Word. Then we are told that the earth was without form, and darkness was on the face of the deep, whatever we may understand by the word deep—something very profound, as it is beautifully and truly stated. We come then to this point, that there was a period when what we call the earth was empty and void, and darkness was on the face of the deep. I take it for granted that our darkness is the type and outbirth of that darkness, and our light is the outbirth of that other light. So with the waters—indeed we could run through the whole of these terms and show that you do find something anterior to the creation, or to the manifestation of creation in our external world. We therefore come to perceive that time has nothing to do with our account of the world. The writer of this paper has touched upon some very important subjects, which we should do well to develop, and I am sure he deserves our best thanks for the essay he has given us.

Rev. C. A. Row.—I cannot understand how the last speaker manages to translate the words *ἐν ἀρχῇ*, “by the beginning;” and I for one entirely deny that you can render *ἐν*, “by.” I would also say that all the renderings of the Greek Testament which would anywhere translate *ἐν*, “by,” are wrong. I may observe, further, that I did not at all share Mr. Titcomb's conclusion that Mr. Warington in his paper meant or implied that the Creator ceased working after the creation. I understood Mr. Warington simply to urge that the Creator ceased merely from His creative working, but by no means from His providential working. I understood Mr. Warington to express himself strongly upon that point, and very properly. The point is one which leaves room for the Darwinian theory, if it is true. I do not hold that theory myself,—indeed I think it is open to very serious objection,—but still it is one which if true admits the existence of creative power. There is one point on which I have some little doubt, and that is as to the precise value of these traditional evidences. We are perfectly devoid of any real knowledge as to the laws by which traditions are formed, and nothing is more difficult in historical studies than to arrive at a certain conclusion on the point. The only English works which have attempted to discuss the real character of traditions, and how they are formed, are Sir George Cornewall Lewis's *Roman History* and his *Astronomy of the Ancients*. There the subject is dealt with in a philosophical manner. When we deal with traditions about the cosmogony, we may have some degree of doubt as to how far they represent traditions fairly handed down to us. Another point where I had a little doubt is one in which Mr. Warington seems to me to be rather obscure. Mr. Warington seems to me to have laid it down too broadly that if philosophy should discover that there is any defect in the cosmogony of Genesis, divine revelation falls to the ground—

Mr. WARINGTON.—But only the divine revelation of that chapter or that part.

Rev. C. A. Row.—Then I have misinterpreted you.

The further discussion of the paper was then postponed to the next Ordinary Meeting.

ORDINARY MEETING, JUNE 15, 1868.

THE RIGHT HON. THE EARL OF SHAFTESBURY, K.G., PRESIDENT,
IN THE CHAIR.

The minutes of the last Meeting were read and confirmed.

The names of the following new Members were announced :—

The Rev. Samuel Lysons, M.A., F.S.A., Hon. Canon of Gloucester Cathedral, Hempsted Court, near Gloucester; and W. H. Balmain, Esq., St. Helen's, Lancashire.

The Discussion on Mr. Warington's Paper on "The Biblical Cosmogony" was resumed as follows :—

[Captain Fishbourne and the Rev. M. Davison opened the Discussion by reading written speeches on the subject, which are not however printed, as Mr. Warington was unable to reply to them, owing to the great length to which these written observations extended.]

Rev. W. MITCHELL.—I have to thank Mr. Warington for the general tone of his paper. There is, however, one point which I cannot quite comprehend; and I doubt whether many of us who approve of the paper generally, have really got a correct view of what Mr. Warington means by "God's days." In an earlier paper which Mr. Warington brought before us, he pointed out the manner in which men of science and defenders of revelation met one another with regard to the interpretation of the word "day" in the book of Genesis; one interpretation being that of an ordinary day from morning to evening—a day of 24 hours; and the other interpretation being that of a long period of time. In this paper, however, Mr. Warington ignores both these interpretations, and introduces another—an interpretation of which I altogether fail to get any correct notion in my mind. It may be my denseness, but I cannot distinguish any difference between Mr. Warington's "God's day" and a lengthened period, in which there may be many natural days and nights. Mr. Warington says :—

"We turn to the question, is the word 'day' to be taken here in its ordinary sense or otherwise? If the word 'day' be used of a period of time, we find in Scripture, as everywhere else, but two meanings which can be assigned to it—a period of 24 hours, or a period of 12."

He goes on to say, that it is sometimes used as a symbol for long periods of

time, as in the second chapter of Genesis, where "the day of creation" is spoken of, and in other places, where we have "the day of judgment," and so on. He proceeds to show that the six days of creation are not intended to represent longer periods of time, "from their being in the fourth commandment paralleled with the days of human toil, which unquestionably are periods of finite duration, and unquestionably of 24 hours' length." And he goes on to say:—

"The notion, therefore, advocated by some, that the word 'day' here is to be taken as intended to denote a period of long duration, must be met by the counter assertion that nowhere in Scripture, or elsewhere, has the word 'day' any such significance. To assume such a meaning merely to get over difficulties, is unwarrantable."

That is a strong protest against the period theory, and Mr. Warington thinks he sees his way out of the difficulty by a hypothesis of his own, which I must say I consider to be inadequate. He brings into use a new interpretation of the word "day," one which, so far as I know, is perfectly original: at all events, I do not know if it is to be met with elsewhere. He says the days are not mere human days, but days in accommodation to our human understanding. They are in fact periods, but I do not know of what duration—indeed I do not know how we are to interpret these "God's days." They are periods in which God has laboured during one portion and rested during the other, and the plain interpretation we must put on the word "day" in the first chapter of Genesis is, that it is a term used for accommodation to the human understanding. All that that chapter tell us is, that there were six distinct periods in which God worked in creation, six successive periods, and that during the intervals between those periods He rested, which accounts for the use of the phrase "and the morning and evening were of the first day," and so on through the six stages of creation. The word "day" then, is used here, we are to believe, solely in accommodation to our knowledge, just as the Scriptures speak of God's eyes and God's ears—of His seeing, hearing, and speaking. Now I must confess, that unless Mr. Warington assumes that these days of God were periods which passed between successive periods of light and darkness, I cannot but think he is evading certain difficulties, in the same way in which he complains of others, who have assumed meanings merely to get over difficulties. With his interpretation I cannot conceive what definite notion I am to apply to the terms "and the evening and the morning were of the first day;" and so on. That we cannot comprehend the whole of the Scriptural account of creation is perfectly true—we have no help from science at all. But the valuable portion of Mr. Warington's paper is found in the admission it makes, that science is totally helpless in the matter of giving us an interpretation with regard to the cosmogony of creation. Science is altogether powerless in the matter, but I am afraid that Mr. Warington, like others, has in his mind a lingering fear of science—

MR. WARINGTON.—No, no.

MR. MITCHELL.—And he endeavours to meet what are now supposed to be scientific facts incapable of being controverted. Very hard measure

is dealt to the many theologians who have given such diverse interpretations to the first chapter of Genesis, while but little is said of the daring assertions of men calling themselves men of science, who gave those theologians the idea that they had scientific proof of matters which the evidence of science has since shown to be utterly baseless. Though I do not go with those theologians who have thus been led astray, still I cannot help feeling a sympathy for the men who, having in view the most powerful evidence that the human mind could obtain, that the Bible is God's revealed word, and feeling the truth of that in their hearts and consciences, and having been told that science contradicted it, have not had the boldness and hardihood to say "We will examine your science, and see whether it contradicts or not," but have striven to make the word of God square, not with science itself, but with imperfect and erroneous scientific interpretations. I care not for the absurdities with which many men have endeavoured to make revelation square, not with science, but with crude hypotheses; but I say these are nothing compared with the absurdities men have advanced under a different guise, and put forward as pure incontrovertible science. I am not afraid of science, nor am I afraid of being thought a century behind my time. I am bold enough to say that geology is in its infancy, and I find that some of those things which I was considered at one time almost a fool for maintaining, are now brought forward as new scientific discoveries. I would not go so far as Mr. Warington in attempting to give an accommodation to the words of Scripture, and which, after all, is only an accommodation. The book of Genesis gives a clear and intelligent account of creation, and if any of you want to know how clear and intelligent it is, I say compare this cosmogony of Moses with the Phœnician cosmogony, or any others, and you will see at once that you are dealing with a different type and character altogether. The cosmogony of the Bible is marked by a sublimity and simplicity which bears the impress of truth, even before you investigate it. Now what are these "days of God," of which Mr. Warington speaks? Is it necessary that they should be lengthened periods? Are they to be considered long periods, during which the earth was revolving on its axis, and day and night succeeding each other? Were these days each equal to thousands of years or not? Mr. Warington speaks of "God's days," and "man's days," using those terms in comparison with each other. Are these long periods required? What do we know of the creative fiat? Was it necessary that a thousand, or a million, or a billion years should have passed in the creation of all the seeds of the earth? Look into that minute thing which gives birth to an oak. Take an acorn, and take from it all the nutritious matter which is to sustain its life, and where is that minute matter that may be the parent of millions of trees? Are we to say that God took a long period to bring these things forth, or did He create all things instantaneously by His almighty fiat? Science tells you nothing here. There is nothing to contradict the plain and simple statement that all these things came into existence at the fiat of the Almighty. Was the creation of light a work of time, or was it done as quickly as man could say "Let there be light?" It is true the Bible tells us that God did take certain

periods for the creation of the universe, and that they were periods between evening and morning. But if you take from these words the plain meaning they bear, you are attempting to accommodate Scripture to your views of science. The narrative is very natural. It tells us that the light was separated from the darkness and called "day," and the darkness "night." Is that in reference to the evening and morning that follow? Are we to ignore all that, and to give the words a metaphorical interpretation? Are we not to take it that those successions of light and darkness implied evening and morning? If we attempt to avoid difficulties and to give the interpretation offered by Mr. Warington, we shall fall into the difficulty which has before beset those who have attempted to make religion and science square upon various interpretations of the days of creation—whether those days are to be considered as long periods, or whether we are to take a long period of God's working in creation between the first and second verses of Genesis. I know there is a lingering impression with many people that there is an enormous amount of irresistible evidence in geology to show that immensely long periods of time must have taken place in the formation of the earth's strata. That is a feeling which exists in many minds, and which affects even Mr. Warington himself, and his interpretation of "God's day" is for the very purpose of giving long periods, or for saying that the work of creation could not have been accomplished in a short period of time. But I would answer him in his own words:—

"The creation of a universe is to God no greater task, no longer or more arduous labour, than a week's work to His creature."

If that is so, could not God have done all the work of creation in six days, such days as we ordinarily mean when we speak of days? What right have you to limit the rapidity of His work? The creation of the universe is to Him no greater task than a week's work to one of us. If that is so, no longer period than a week's labour is required. Why should not God be able to accomplish all creation in a week as we ordinarily interpret it? I see gentlemen gravely shaking their heads at me for being so heretical as not to give in to what are still the popular theories with regard to geology. I am glad to see that Mr. Warington in his paper endeavours to show how very little purely scientific evidence geology has to give us on the subject at all. I say we have no means whatever in the present state of the problems of geology of determining how long a period of time any one single stratum took in its formation. I would like to know if Mr. Babbage could give you an equation to determine the age of granite or sandstone. What a vast number of unknown quantities you would have to put into your equation! It would be an indeterminable equation at the least, consisting of a vast number of unknown quantities. Those who would endeavour to give an interpretation to the days in Genesis should wait until science is sufficiently advanced, if ever science does sufficiently advance, to give them something like a true geological theory. We have heard much of the nebular hypothesis, which was introduced to the world under the sanction of the name of Laplace, and

that was a theory which was set forth as one of the indisputable facts of science. Mrs. Somerville, in her *Astronomy*, told you to look into the heavens and see there the masses of star-dust or objects irresolvable or resolvable into worlds in the chaotic condition in which this world was supposed to have been in originally. But how quietly that theory has glided out! Indeed it has hardly been assailed. The only thing that really assailed it was the large telescope of Lord Rosse, which showed that a vast number of these supposed irresolvable nebulae were really resolvable into multitudes of definite stars similar to the Milky Way, and then the nebular theory disappeared—

MR. WARINGTON.—It has not quite gone yet.

REV. W. MITCHELL.—Well, it has very nearly, so far as scientific acceptance is concerned. Now there has been another geological theory which has caused men to indulge in so many interpretations, and to give themselves such exegetical labour among the Hebrew words of the first chapter of Genesis, so as to meet the supposed geological fact that there were a vast number of successive creations on the earth, separated from one another by long and definite intervals of time. But Sir Charles Lyell has since shown very fairly that the successive-creation theory is no longer tenable—that it cannot be held—that it will not bear a strict scientific investigation—

MR. REDDIE.—Except Sir Roderick Murchison, perhaps, all geologists have given it up.

REV. W. MITCHELL.—It has been replaced by Darwin's successive-development theory; but how long will that last? It has been broached very lately, and it has been found already by its author that it requires to be bolstered up by another hypothesis—pangenesia. I say that that development theory will have to follow the course of the nebular theory. It has been the same with the theory of the igneous formation of the earth, and with almost all the great geological theories which have caused men to make such strange interpretations of the first chapter of Genesis. I know I shall be thought a heretic when I say it, but there still lingers in the minds of men a notion that there is indisputable evidence in the strata of the earth that animals, birds, and fishes must have been existing on the earth during millions of years? But Science is not able to demonstrate that, and fails whenever she attempts it; and she has been just as fallacious with regard to other geological theories. I say, cannot you rest patiently and wait for the evidence of science, and interpret the facts of science with due modesty? What I complain of is that the modern course of geological investigation has been entirely opposed to those sound Baconian rules of induction by which such great advances in science have been made. Geological science has been kept back because geologists have neglected the sound rules of induction. Read Sir Charles Lyell. He makes the admission—the candid admission—that the hasty reception of geological hypotheses, as, for instance, the successive-creation theory, has prevented geologists from accepting a vast number of real geological facts which have been brought before them, and which have been ignored because they were not found to square with these

hypotheses. I think the most satisfactory thing with regard to Mr. Warington's paper is this, that to any candid inquirer it must go forth that there is no reason why men should twist and turn the interpretations of the book of Genesis on account of any evidence science would afford with regard to it. I say that science has its difficulties as well as revelation. I remember a passage in Carlyle's *Sartor Resartus* in which he treats with scorn the proud pretensions of man with regard to human knowledge and science. He says, in substance, for I do not remember his exact words,—“You talk of your learning and science, but what do you know? You know the when and the where of a few small balls revolving, as you suppose, round one big ball, and of a few secondary planets revolving round the larger planets. But how many of those do you know, and what do you know of the millions of others which pass in one hour over the field of a single instrument fixed in an observatory? What do you know of the laws ruling and guiding them? You talk, with your puny knowledge, of that which is, after all, as compared with the great mass of the stars, but a grain of dust compared with the sand of the desert.” If that is the fact with regard to science, it should teach men of science to be humble, and show them that the work of the scientific man is not to profess to be a God to himself, and to interpret everything according to his own understanding and judgment, but to be the interpreter of God's works. Let the scientific man do that and he will always find his reward. What do we know of electricity and magnetism? A few years ago we used to talk of an electric fluid—of vitreous and resinous currents. We have got rid of that now; but do we yet know what electricity is, or magnetism, or gravity? We are as ignorant of gravity as Newton professed himself to be after he had discovered the law. But we may look at the facts of nature, and use them for ourselves. We know that a magnet points in a certain direction, and that if a current of voltaic electricity be applied at right angles to the magnet, the direction of the magnet will be turned. That is a fact that does not depend upon any theories of electricity. Whether you speak of it as molecular vibration, or as a fluid, is purely a matter of theory. But the fact itself enables you to annihilate time and space, and to speak from the old world to the new in a couple of seconds. That is the proper interpretation of the facts of nature, and that is the work which geologists have to do—to go on accumulating facts and not manufacturing theories concerning them, or if they do, desiring convenient formulæ, to hold lightly by them, feeling that next day something may upset them. And here I would give a word of warning to those gentlemen who insist so strongly upon long periods in the work of creation. All the evidence of geology which we now possess is admitted to be negative evidence, which might be upset any day by a positive fact. Suppose you say that man is the most recent creature on God's earth. That was the theory a little while ago,—that man was not co-existent with the mastodon. But suppose you found human bones in the red sandstone, and decided human remains in some other stratum supposed to be far more ancient than sandstone, lying side by side with the remains of the most ancient inhabitants of the world. Where

would your theory be then? You would have to go to the book of Genesis and give a new interpretation of days to make things square. And that is how you attempt to accommodate God's word to imperfect science. If you have got a scientific turn,—and God does impress some men to search for the results of nature,—if you will only do that, and read them fairly, be assured you will get a great reward, and confer a great favour upon the human race. (Cheers.)

MR. REDDIE.—I think the tone of Mr. Warington's paper scarcely called for so strong an attack against scientific theories generally. The paper is a very fair one, and I think we should receive it very much in the spirit in which it is written. Not that I altogether agree with Mr. Warington, for I feel some difficulty about what he calls "divine days;" though I think that theory has been put forward very fairly, and not offensively, like some other theories as to the days of creation. I think it also gets over many apparent difficulties which have been felt by geologists; and I cannot help believing that it will probably be well received by scientific men as a present standing-point on which they may rest with reference to geology and Scripture,—at least by those scientific men who are not merely anxious to find that the two utterly disagree. There is, to my mind, a great difficulty in the natural day theory as put forward by Captain Fishbourne. In the first acts of creation, for instance, the creation of light, and the separation of land from the water, and before the sun and moon were made, you simply cannot conceive that the day was measured by a revolution of earth or sun. But, then, there is a further difficulty on the subject in Mr. Warington's paper. Mr. Warington says:—

"The Biblical cosmogony was intended for no one single nation or place, but for the whole world."

I quite agree that the Bible account was intended to instruct the whole world; but that is not all he means; for he goes on to say, in another passage, that the creation itself had no special reference to any one place. He says:—

"By this proposition, then, we dispose of all theories which would limit the creation spoken of to a particular portion of the earth's surface, or which would confine the significance of its form—the six days' work and seventh day's rest—to the Jewish Sabbath."

Now, I think you cannot get rid of some limit of creation to a particular portion of earth's surface. Captain Fishbourne certainly cannot in his view; for, take a day in the arctic regions near the north pole measured by the continuance of light,—why, it lasts six months, and so does the night of darkness. I think there will be great difficulty in getting out of this upon any literal interpretation whatever as to the days of creation. I can only get out of it by believing just the reverse of what Mr. Warington puts forward, i. e. by believing that after the original creation of the heavens and the earth, the subsequent acts of creation commenced at a particular place, and had reference to the day and night there especially. It seems most natural to consider

that the dry land was first made to appear at one particular portion of the terraqueous globe, and that the creation of what the land produced commenced there. Then, if we grant that from the first certain laws and principles in nature were established, and that those laws were carried into effect by acting upon the material elements and under certain conditions ; as, for instance, that the earth should "bring forth" grass and plants, &c., according to the soil ; then, I think, we must see that there is no reason to suppose that creation should not thus have commenced in one place. You will remember that the late Mr. Hopkins, in his interesting theory of the formation of the earth, told us of new land, such as that of Australia, for instance, coming up out of the water and producing the primitive forms of plants and trees ;—I do not, of course, mean to say without seeds, but by the earth nourishing the originally implanted seeds or principles, it might be, of vegetable life which had remained in it. The prolificacy of virgin soils is, in fact, proverbial. I cannot myself see the slightest difficulty in accepting the literal days of the Scriptures if we adopt this view of a definite centre of creation ; and, certainly, there is none in geology. Mr. Davison seemed to think that Mr. Warington went too far in what he said about the whole of the earth's materials having probably been under water ; and even Mr. Warington himself says this is perhaps too bold an assertion. But, so far as geology is concerned, I should say that this perhaps is rather too mild ; for we know that the sedimentary rocks have necessarily been under water, and we now know also that the crystalline rocks have been transformed or metamorphosed from sedimentary rocks. Granite itself is now admitted to have been formed in that way.* But I should like to be informed by geologists how they now imagine the sedimentary strata were formed, and upon what foundation they were laid. There is another point I must mention, because I do not think Mr. Warington has shown himself so logical or clear-headed as usual with regard to it. He says :—

"The Biblical cosmogony was intended for no one single nation or place, but for the whole world. This is evident from the fact that similar cosmogonies—some, indeed, grievously distorted, and all markedly inferior in simple sublimity—are found among many other ancient nations also."

I think this conclusion is a *non sequitur*, and Mr. Warington, I think, will hardly be able to maintain this argument from the fact that similar cosmogonies are found among other nations—

MR. WARINGTON.—Read the remainder of the passage, from "If, then."

MR. REDDIE.—Certainly :—

"If, then, the Biblical cosmogony be, as it implicitly claims to be, a Divine revelation, it clearly must have been one intended for mankind generally, given before the dispersion, and of equal value in every part of the world."

But I do not see how its general value now makes it evident that "the Biblical cosmogony was intended for no one single place"—

* Vide *Journ. of Trans.*, vol. ii. p. 334.

Mr. WARINGTON.—Because it was given before the dispersion.

Mr. REDDIE.—When, I might say, the human race was actually concentrated in one place! Then Mr. Warington gives us a new scientific theory as to the space above the firmament. No doubt it is very ingenious, but he does not explain how, according to our present knowledge of meteorology, water could be maintained in a liquid state as a sort of sphere above the firmament—

Mr. WARINGTON.—I did not say a sphere.

Mr. REDDIE.—I understood you to say something of a watery sphere—

Mr. WARINGTON.—Nothing of the kind.

Mr. REDDIE.—Well, I will put the notion in a form still better for Mr. Warington. I do not propound the theory myself—it comes to me on the authority of the late Admiral Fitzroy and the late Sir John Lubbock. They had a theory that the atmosphere of the world or universe is surrounded by viscous or frozen air.* There you would have something solid, though of a watery nature, surrounding us—something like a crystalline sphere, or like a “molten looking-glass,” as the sky is described in Job; and if the air became so rarefied as to be viscous, perhaps you might thus have a surface which would reflect the light, if light is reflected rather than diffused in the atmosphere.

Rev. M. DAVISON.—Permit me to say here, with regard to the theory that the globe was once entirely covered with water, we have no geological phenomena on which we can base such a theory. There is nothing to show that there was not both sea and dry land at the same time.

Mr. BROOKE.—It always gives me the most exalted idea of the unity and comprehensiveness of the Almighty power to suppose that that Almighty power, having impressed on matter certain properties, did produce a succession of changes, solely in obedience to the action of those properties, extending over periods of time which I will not pretend to define, and so created the earth fitted for the habitation of that being who was created in God's own image—man. It is true that it would be presumptuous to limit the power of Omnipotence; but I would ask any one, Can he doubt that the creation had an object,—that it did not come of itself,—that the inorganic elements did not happen to fall together in this particular form? No one doubts that it had an object. We cannot fail to trace beneficent design in every stage and portion of creation, and I cannot resist the conclusion that the earth was gradually fitted for the habitation of man. I would, however, protest against that being considered science which is, in fact, mere hypothesis. Mr. Warington says:—

“The Creator is resting. Nor does science stop here, but boldly comes forward with a reason for this inactivity. There is no need for creative power, for all things in the universe are so constituted, so governed by law, so fitted into one another, that by mutual action and reaction the whole machinery of the world is kept in unceasing motion, self-guided, self-adjusted, self-energized.”

* *Vide Journ. of Trans.*, vol. i. p. 105.

But does science say so? It is mere hypothesis. Is it possible to conceive that those properties of matter originally implanted by the Almighty fiat, could continue to exist without the continued action of the Divine will, just as they were originally implanted by the Divine will? I cannot agree, therefore, that science teaches us that the world could go on "self-guided, self-adjusted, self-energized," or go on at all, without the continual operation of the Divine will.

Rev. Mr. WAINWRIGHT.—I agree most cordially in all that has fallen from Mr. Mitchell. There is considerable danger in seeking out means of accommodation between the supposed discrepancies between Scripture and science. If you shore up a perfectly stable building with buttresses which are not sure, there is certain to be an impression created in some minds that the stability of the original building has been in some way impaired. You should never attempt to buttress up a sacred truth with an imaginary truth. With regard to the general problem of the language of Scripture, we should bear in mind that what God had to do was to give a revelation of His mind so as to be intelligible to all generations of men, and should yet convey to them no more of truth with regard to other purposes—say scientific truth as apart from religious. The Bible was not intended to be scientific; but yet it was meant to be so absolutely true that the development of science in successive generations should never be able to detect in it the least flaw. These conditions have been properly fulfilled. The Holy Scriptures, where they relate to scientific subjects, have been verified after they have been for several centuries laid under a stigma as being supposed to be notoriously inaccurate. We have often seen the tide of scientific opinion turned round. Moses was supposed to be wrong in telling us that there was light and heat before there was a sun, which was supposed to be the source of light and heat. But what does geology tell us? It tells us certainly that there was vegetable and animal life, that there was growth, and that consequently there was the light and heat essential to it, before there was a sun; and the latest, the very latest theory demonstrated as a possible theory, would show much more than that—that there was light and heat for millions of years before there was a sun. This shows, then, that I am right in saying that the positions of scientific men and geologists are continually shifting away. Take another instance. There is not a single known instance in the records of mankind of a low embroiled race ever emerging from that condition to a higher one without external aid. All evidence on the point goes to confirm the declaration that man was made perfect, and thus the Scriptural declarations are verified after all. And mere scientific declarations have been falsified in a manner equally remarkable. That has been the case with the igneous theory, and also with regard to the theory as to extinct animals.

Mr. WARINGTON.—In replying to the various arguments which have been brought to bear against my paper, I must in the first place say that the address of Captain Fishbourne contained so many misunderstandings of what I had said that I was unable to note them all down, and certainly have not time to answer or rectify them now. But now let me excuse myself

for the seeming presumption of putting, in parenthesis, the phrase "added by a later hand" (p. 344). I do not expect any one to take that on my dictum; but not to go into all the evidence, which would require a paper three or four times as long, I may say I have evidence on the point which I think is conclusive. I simply wish to explain that what I mean is that I believe Moses was the author or compiler of Genesis, and I believe the second chapter is mainly from him, but that he had the cosmogony of the first chapter already in existence before him, and in using it he added other clauses concerning the creation. The passage "breathing into his nostrils the breath of life," I do not treat with any disrespect, but I believe it had reference only to the people of Israel, and not so much to the whole world. That was why I thought it necessary to put in that clause. One point has already been touched upon by others—that is, that I fully admit that there is a sense in which all things are still dependent on God—I fully admit that as Ruler and Governor His work in the universe is essential to the continuance of the universe. But I draw a distinction between the creative energy and the sustaining energy, with which we have to deal at the present time. With regard to the "self-sustaining power," perhaps the language I used was a little too strong; but having previously used language quite as strong as to God being still Ruler and Governor, I thought I might use the terms I did in reference to the self-sustaining force of nature. There is now no creation going on, but all the energy and force appears to reside within nature, not coming to it as a fresh impulse from without. Then there are a few cases in which the renderings I adopted have been called in question. I pointed out the different senses in which the Hebrew verb הָיָה is used. My authority was Dr. Pusey, who is universally regarded as a first-rate Hebrew scholar, who deals with the point in his preface to the Prophet Daniel. I therefore take it that the sense and construction of the second verse does imply that chaos was the state and condition in which the earth first existed, and not into which it passed. When Dr. Pusey, who had nothing to prove by it, stated that the Hebrew would bear that construction, I thought I had a right to use it. The mere difference of tense, however, was not my argument. Part of what I meant is that all through a particular form of the verb "to be" is used to express succession, and where another form is used I think it shows that the author meant to imply something different. That is a sound argument, even if the Hebrew tenses are rather lax. Then there is a question as to my translating "and made" to "by making." I can quote three or four first-class Hebrew scholars who have given this as the proper grammatical interpretation. It is the infinitive of the verb, and so may be translated "to make" or "by making," but it cannot be translated "and made." Then there is the important point as to the word "day." I did not expect that every one, or indeed many, would see what exactly I meant by my view. We are so in the habit of associating the word "day" in the first chapter of Genesis, with a short period of twenty-four hours, or a long definite period of time, and have completely shut out of our minds

anything like a relative period of which we do not know the dimensions, that when one advocates a relative rather than an absolute period, it is difficult to comprehend the idea at all. I do not believe that by the days in Genesis we are to understand periods of enormous length, nor do I believe that we are to understand periods of twenty-four hours each. I do not think either of these ideas was in the mind of the writer. I wish to shut out the idea of absolute duration altogether, and to take simply a relative duration, which would be to God what a day is to man. Not knowing the nature of God, we are not in a position to judge what that period would be. We are not to take the days literally, but as representative, given in accommodation. It is said that if we take days in that way, we put a sense upon them which they will not bear. I fail utterly to see how that is the case. I know that when Hugh Miller put forth the theory that by the word day we were to understand a period of enormous length, that was putting a different meaning on the word which it would not bear, and bringing in an interpretation of science which should not have been brought in. But I do not go to science—I go simply to Scripture. I ask how does Scripture speak of God's actions. Never by literal terms, but invariably by representative terms, and I feel bound, therefore, as a matter of exegesis, to give such a sense to the word day, and no other. If it was clear that the whole creation took place in less than six natural days, I should find no more difficulty in believing it than in believing that it took a great deal more. I am not bound to any definite period, long or short, but I am bound to believe that the Biblical cosmogony was not to teach us how long the work of creation occupied, but in what relation creation stood towards the nature of God. The instant you attempt to put any absolute duration at all, you go away from the spirit of the narrative, and land yourself in difficulties. The moment you give definite duration, you sin against the spirit of Genesis. That does away with the difficulties which have been raised with regard to the nights. If I thought the days were definite periods, I should think I was bound also to find definite periods of rest—certainly those who hold to definite periods of twenty-four hours are so bound. Hugh Miller has professed to find one period of rest, but not seven such periods. This difficulty I am free from. I have no need to show definite periods of rest to correspond to the nights—the nights, too, are simply representative,—the imperfect human symbols of otherwise unintelligible divine realities—

Mr. REDDIE.—And all merely in accommodation to our understanding.

Rev. W. MITCHELL.—Granted that the earth revolves on its axis, we do not know how long that revolution has always lasted. We do not know how long the days have been always, and certainly we should not attempt to define them. But I say there is a danger in this interpretation which does not take in the “evening and morning” of the Scriptures.

Mr. WARINGTON.—It seems to me that having given the force and sense to the rest at night which I have done—and it is not altogether original, because I found it in another book, adopted purely on exegetical grounds, and without the slightest hint of anything approaching geology—it relieves

me from any necessity of giving any other meaning to the words "morning and evening." Then I have been told that I omitted the effects produced by the fall of man. But that was because they did not come within the scope of my paper. My paper was not on the whole history of the creation and fall, but on one part, and I omitted all reference to the fall except to point out, by implication, the effect which the fall must have had upon the entire universe. I have said in my paper that the top stone of the whole system of creation was man, and that his office in the universe, by which he completed the whole work, was to act as the representative of God by the faithful occupation of the earth and not by the selfish enjoyment of it. When therefore he descended to the selfish enjoyment of it, it follows that he must have disturbed the work of the Creator. As to the existence of light before the heavenly bodies, some stars have been measured, and from the most distant stars actually measured, the light would not take more than a century to pass to us. It is, I believe, mere hypothesis founded on the apparent magnitude of certain stars, to say that there are stars beyond so distant that it would take a thousand years for their light to travel to us. But if that were proved, it would not touch my position. It would only be an evidence that the actual stages of creation were long and short periods, because the stars were called into existence on the fourth day, and had the whole of the fifth and sixth days before them. If science should demonstrate that there were stars in existence more than 6,000 years ago, that would only be a proof to my mind that the fifth and sixth days were long, and not short periods. I have been told by Mr. Mitchell that I wrote as if I were afraid of science. Now I must protest against that. Neither now nor at any other time have I had the slightest fear of science. I used to hold Hugh Miller's theory, but I gave it up three years ago, because I found it sinned against both science and Scripture, and I remained without a theory for some time. Now I have another, which seems to me satisfactory in both respects. I have had no occasion to form one to satisfy my own mind—I could go on with a suspended judgment. I have a reverence for science, and that may have led me to endeavour to unite what I suppose to be the facts of science and the facts of Scripture. I was very much surprised to hear Mr. Mitchell say that these theories of cosmogony were based on doctrines of science given by scientific men. Many of the hypotheses put forward were not scientific at all, but purely theological—

Rev. W. MITCHELL.—My point was that when Christians put forward such crude ideas, it was because they were attempting to meet what were thought to be scientific facts, and that if there have been blunders on the part of Christians in attempting to defend their faith in Revelation, there have been still greater blunders brought forward under the guise of science.

Mr. WARINGTON.—It seems to me that these theological theories never had any scientific basis at all—the theologians had it all their own way. Then the question has been asked, "Why should a long day be necessary?"

But I do not think any one will find that I have said long periods are necessary. The book of Genesis leaves it an open question for science to settle without interference. I have no lingering impression in favour of long geological ages. I do not care how long they were—it is a matter of pure indifference, because the Bible tells me nothing on that head at all. Some reference has been made to the resolution of nebulae. Only a week ago I heard a lecture delivered by Professor Roscoe, of Manchester, on the spectrum analysis. Mr. Huggins, who has laboured hard in that field, was present, and it was upon his statements that the lecturer founded his assertions, which were very remarkable; that every fixed star examined was found by means of the spectrum analysis to have a constitution similar to our sun—a solid or liquid nucleus emitting light and surrounded by an atmosphere; but the instant they touched the nebulae there was no solid matter nor no liquid matter—nothing but incandescent gas, and that this was invariably so—

Rev. W. MITCHELL.—Were those the nebulae which have been resolved?

Mr. WARINGTON.—The lecturer said the spectrum analysis had been used with regard to these nebulae which it was stated had been resolved into actual stars, and these so-called stars were found invariably to be incandescent gas, a little more agglutinated together, a little more compact, and, therefore, more brilliant, but utterly unlike real stars—

Rev. W. MITCHELL.—It may be a question whether it is possible for the spectrum analysis to adduce these facts—whether it is possible to tell you so much.

Mr. REDDIE.—And if true it does not prove anything, unless it also proved that these nebulae are changing into worlds.

Mr. WARINGTON.—Another question which has been raised is as to whether the earth has been wholly under water. Although it is true that the majority of the rocks have been formed under water, it does not follow that the whole earth was at any one time under water. There may at all times have been dry land, and the earth been denuded and reformed; and we do not know how many times that may have taken place before the formation of the rocks as we see them. It seems to me that the formation of rocks under water is no proof of the whole earth having been covered with water. With respect to the watery sphere, I am sorry I was so far misunderstood. I did not say there was a watery sphere at all, but that above the clouds there is liquid water in a cloud-like form, though rather more thin and spread out—a number of extremely minute globes of water. That is not a watery sphere. I must also object to the idea of frozen air being watery. If frozen, it would still be air, and not water. I was astonished at the assertion made by Mr. Wainwright, that geologists had proved the existence of light before the sun. It amazed me to think by what possible evidence such a thing could be proved. I can well imagine that you could prove light had existed, but how you could prove where it came from is to me an enigma. I think I have now touched on all the principal points that have arisen in the discussion, and I thank you much for the patient attention you have given me. (Cheers.)

The CHAIRMAN.—In bringing this discussion to a close, I will only say that I hope scientific men will go on perseveringly, making every possible discovery they can. I recollect Sir James South telling me that M. Laplace had said to him, "We have opinions and theories enough; what we want are facts." I will only add that if this Institute goes on as it has hitherto done, it cannot fail to lead to the very best results.

The meeting was then adjourned till next session.

NOTE (*See* pp. 378—383.)

If above the clouds there is a "liquid water," spread out in a "cloud-like form," and this water lines, as it were, the whole firmament, or composes it; I apprehend it will thus necessarily form a sphere. And I suppose that some watery particles must be mixed with the air before the latter could either become frozen or viscous. So that it does appear to me that Mr. Warington's theory and that of the late Sir John Lubbock have very much in common.—J. R.

ORDINARY MEETING, DECEMBER 7, 1868.

THE REV. DR. THORNTON, VICE-PRESIDENT, IN THE CHAIR.

The minutes of the last Meeting were read and confirmed, and the following elections were announced :—

MEMBER :—His Grace the Duke of Rutland, K.G., &c., 10, Cromwell Road, S.W.; Chevening Park, Newmarket; and Belvoir Castle, Grantham.

ASSOCIATES, 1st Class :—David Henry Stone, Esq., Alderman of London, Fairwood, Sydenham, S.E., and Castleton, Hollington, Sussex; Joseph Jones, Esq., Belfast.

It was also announced that the Rev. M. Davison had been elected a Member of Council, and that the Rev. Dr. Robinson Thornton had accepted the office of Vice-President.

The following books were reported as donations to the Library :—

The Geology, Minerals, Mines, and Soils of Ireland. By Joseph Holdsworth, Esq. *From the Author.*

Proceedings of the Royal Institution of Great Britain for the year 1868.

From the Council.

Anti-Colenso. By "Johannes Laicus."

From John Poyer, Esq.

CHAIRMAN.—We enter this day, for the third time, on our annual campaign against the scepticism of the age. As of old the Roman armies retired into winter quarters, and gathered fresh strength against the enemy, so have we retired, according to custom, for the summer season, and meet again now, I trust, with renewed powers. The warfare for which we have to prepare is not offensive, but defensive; not an invasion, but a protection. It is not the warfare of an Alexander, who led an active army against the effete troops of an earlier despotism, and vanquished them by the very freshness of his assault; it is rather that of a Fabius, who wore out a new and active enemy, not by meeting him in a pitched battle, but by cutting off his supplies, and demolishing all that he counted upon as strongholds. I cannot forbear saying a word or two on the position which I now occupy. It has pleased the Council to place me in this honourable position; it has pleased you to endorse their decision. Although I cannot lay claim to the

high distinctions and manifest qualifications of your other Vice-Presidents, I can say this much, that I do not yield to them in my devoted adherence to the written Word of God ; and it is in my hopes that our Institute may and will accomplish its noble mission,—that of showing that the Book of Nature is not a contradiction to the Book of Grace. I shall trouble you with a few words on the present attitude of Science towards Religion, and on the duty of our Institute in the present conjuncture :—

There was a time, perhaps, when Religion was afraid of Science, and reviled it ; because Science restrained the enormous power which Religion claimed over the intellect of its votaries, and the vast demands it made on their belief. When the *λογικὴ λατρεία* of St. Paul was made to consist in the entire submission of body, soul, and spirit to an ecclesiastical superior, we cannot be surprised that Science occasionally pointed out that infallibility could not be presumed to extend to the region of material facts, or the laws logically deduced from an observation of those facts. And so Science was abused and condemned by Religion.

Things are altered now. *Nous avons changé tout cela.* Religion and its advocates are now sometimes censured (to use no harder term), because the teachers of Faith call attention to, and decline to accept, the hasty generalizations, and still more hasty inferences, of the followers of positive science. It is a very curious fact that a particular branch of study, which in past times was objected to by those whom I may call the Religionists, is now deprecated by the adherents of Science. The opponents of religious freedom in bygone days set their faces strongly against the study of Greek. It is a curious coincidence that so many of the opposite school in the present day declaim against the study of the same language as a needless and unprofitable waste of time. I shall not weary you with attempts to give a reason for this coincidence, though I believe one could be given. It is enough for me to call your attention to the fact, that whereas in past times the clergy opposed and reviled Science, it is now the men of science who—rightly or wrongly—oppose, and sometimes speak harshly of, the clergy.

But why should this be ? Why cannot Faith and Induction coexist in the same mind ? Why cannot the teachers of that which must be proved, and the teachers of that which must be believed, go on harmoniously in their grand task of uttering, though it be in a different key, the praises of the one Creator ? The work of our Institute is to mediate between the two : to show that Science, if really scientific, cannot be

opposed to Religion; and that Religion,—revelation I mean,—rightly interpreted, is not opposed to Science: that if the Bible seems to contradict true Science, it must be wrongly interpreted; and that if Science appears contradictory to the true interpretation of the Bible, it is not really scientific.

That difficulties must be expected in the Scriptures is perfectly clear to one who believes them to have proceeded from the Creator. The book of nature is hard to interpret; the book of grace may be presumed, *à priori*, to be likely to prove equally hard. There are things in nature which, taken by themselves, would give us a false notion of the Author of all; what wonder if there be such in Revelation? Never was a wiser sentence penned than that of Origen, the text, as it were, of our own Bishop Butler's "Analogy": *Χρὴ . . . τὸν ἀπαξ παραδεξάμενον τοῦ κτίσαντος τὸν κόσμον εἶναι ταύτας τὰς γραφὰς πεπείσθαι, ὅτι ὅσα περὶ τῆς κτίσεως ἀπαντᾷ τοῖς ζητοῦσι τὸν περὶ αὐτῆς λόγον, ταῦτα καὶ περὶ τῶν γραφῶν*: "He who holds that the Scriptures proceeded from the Creator of the world, must admit that as many difficulties will meet him in the Scriptures as in Creation." In fact, we may go on farther to say that these very difficulties are themselves a proof that what they occur in, nature or revelation, proceeds from a Divine Being. If nature were not hard to interpret, if Scripture were not hard to comprehend, both might have been the work of human intellect; but as it is, both exhibit the evident tokens of a superior mind; the All-powerful and the All-wise.

But a more extended knowledge of nature and a more profound acquaintance with Scripture cause many a fancied discrepancy in each to disappear, and remove many a difficulty which at first sight was insurmountable, just as a mighty telescope resolves into separate stars many a cluster which weaker instruments only presented as a perplexing nebula. And, therefore, we may well imagine that a higher knowledge still, a knowledge which should rise above all that science and all that scriptural study have yet attained, and contemplate both from a superior stand-point, *might* perceive, and *would* perceive, that those seeming differences between the two books of God, which so perplex us now, are in reality but two poles of the same ray of truth, two beams which, to weaker vision separate, are yet phases of one and the same emanation from the Source of all Light.

But have we approached this higher knowledge yet? The Scriptures have been before us, and Nature has been about us, for many a century. But what have we yet attained? Much, perhaps, yet only a fraction of what is needed, in the

interpretation of the written book. Still less, I think, in science. With all the stupendous discoveries of these days, with the telescope, and the microscope, and the spectroscope in our hands, what have we reached? Is not geology yet a fluctuating science? Is there anything settled in anthropology? I select these two because they are the two which seem to come most into collision with the Word. Have these two sciences arrived at such a state of certainty and fixity, that their adherents can say to us believers in the Christian Scriptures, "Here are clear proofs of the erroneous character of your text-book; this is our creed, and we will weigh it against yours"? In short, how dare the men of science tell us that they are logically persuaded of the falsity of our principles, when they are not yet certain of their own? Then, on the other hand, we readers of Scripture as well as of Science must be very careful how we assert our Book to be opposed to the conclusions which our adversaries allege against us. This leads me to touch upon an error into which we Christian believers may run some risk of falling. Do not let us commit the grand mistake of pooh-poohing the discoveries of scientific observers. There is always a danger lest the teacher of Faith should undervalue sight. We know that our opponents fall into the converse of this error. They teach sight, and undervalue faith. The *ultima ratio* of the positivist is often this, "You don't expect one to believe *that*—a clumsy forgery and ridiculous invention! you cannot require me to take notice of an absurd string of meaningless or contemptible legends!" But (to borrow an idea from Dr. Newman) the Bible has been long enough in the world, and believers in it have been in the world long enough too, to justify all in dealing with it and with them as a fact. So we claim to be treated as a fact. If so, we must not refuse to assent to facts in possession of the other side. The carved and shaped flints in the drift, the bones of extinct animals, the geological terraces, the lake-dwellings, the submerged forests, the Nile mud,—all these are facts. They must not be ignored or undervalued. Let us remember that we have cautiously to test the inferences drawn from them, and show, as we can show, that these inferences, where legitimately drawn, are not logically inconsistent with a single paragraph in the Scriptures, if rightly understood, and not pressed beyond its meaning.

Another caution, and I have done. We must be very careful in this Institute not to tread upon dangerous ground. We must not become *theological*; we are a *scientific* society. We are certainly at liberty to examine, exegetically, the meaning of Scripture statements which we defend; but we

have nothing whatever to do with religious differences or ecclesiastical controversy. Depend upon it that every polemical word—polemical I mean as regards religion,—that is uttered here, will prove a word in our death-warrant. Those higher spiritual truths which all of us, in some form or other, hold by and maintain, must not be brought up in our dealings with those with whom we are doing battle. We *must* keep religious schools and parties entirely out of our papers and our discussions, or we shall not be able to do our work in defence of Religion.

It is our privilege to hope that hitherto we have been doing something: that our Transactions have proved at least that there is something to be said on our side, and stayed a few waverers from a hasty acceptance of sceptical crudities; and last, not least, that we have shown all schools of thought that the firmest attachment to Scripture is not incompatible with the truest liberality.

A vote of thanks was unanimously accorded to the Chairman for his Address, and he was requested to allow it to be published in the Journal of Transactions.

In the absence of the Author, the Secretary read the following paper:—

*ON ETHICAL PHILOSOPHY, IN ITS RELATIONS
TO SCIENCE AND REVELATION. By the Rev.
W. W. ENGLISH, M.A., Vicar of Great Wollaston. Mem.
Vict. Inst.*

THE different branches of science and philosophy are all worthy of the closest study. But there seems to be, at this present time, somewhat of pride or conceit connected with scientific utterances. The theologian may be, and no doubt often is, at fault; but so is the professor of science. There are difficulties in seeing a perfect harmony of truths, because an acquaintance with truth, in all its branches, if attainable at all by any one man, is attained by very few men. We accomplish nothing, however, by sneering at one department of study, as metaphysics or theology, and by deifying another, as physical science. The vice of the Positivist is one-sidedness; and the Physicist is sometimes seen to be no other than a one-sided enthusiast. Men either cannot take in all the truth, or they have not the opportunity, or inclination, to study it in all its branches. Hence the scientific man is just as one-sided as the theologian, whom he is so fond of lecturing

in this age. Dr. Tyndall should have known, when he finished up one of his scientific lectures with a few lines from Carlyle about

“thy small nine and thirty Articles,”

that no theory of the “Universe” was to be found in them at all, and that he was quoting a dream, when a fact would have been more congruous both to his profession and his subject.

“Qui, ne tuberibus propriis offendat amicum
Postulat, ignoscat verrucis illius.”

I regret to see Dr. Tyndall's example copied by Professor Huxley, and still more recently by Dr. Hooker, because neither science nor philosophy can ever receive benefit by dragging the “clergy,” or “religion,” or both, into essays of a professedly scientific character. If any of the “clergy” are “noble savages” as regards their knowledge of what constitutes Dr. Tyndall's specialty, they may have reason to think that learning in another direction, if not good manners, is capable of extension outside their own profession. Some time since learning was confined almost exclusively to the cloister. Roger Bacon, in the thirteenth century, was celebrated for his knowledge of physics, mathematics, astronomy, chemistry, and medicine, and the people looked upon him as a magician. But we have reason to be thankful that learning is now no longer a monopoly, nor peculiar to any class, though it is true that a committee, not of the “clergy,” but of the House of Commons, voted George Stephenson a madman, not very long ago, for devising a scheme of locomotion. (I am amongst those who believe that Stephenson has got much of the credit due to Mr. W. James: see proof of this in the *Mechanics' Magazine* for Oct. 21, 1848.) But let us all remember that knowledge in one department can never entitle any man to say proud things about another. No lecture on science can ever end well with a sneer at theology. At least I may well be pardoned for thinking that a wider acquaintance with the two branches of knowledge would lead to a dignified treatment of both.

When I undertook to write a paper for this Society on a former occasion, I was so fully convinced that the study of mind was being overlooked by some engaged with the properties of matter, that I made it a chief point to bring into prominence some of the phenomena of the soul (I use mind in a generic, and soul in a specific or individual sense), as thought, feeling, will, &c. And I rejoice to see that Dr.

Tyndall has been speaking of these phenomena lately with a modest hesitation. He is reported to have said :—

“Associated with this wonderful mechanism of the animal body, we have phenomena no less certain than those of physics, between which and this mechanism we discover no necessary connection. A man for example can say *I feel, I think, I love* ; but how does consciousness infuse itself into the problem? Science is mute . . . But if the materialist is confounded and science rendered dumb, who else is entitled to speak? To whom has the secret been revealed?”

I am ready to admit that the “problem of the connection of body and soul is as insoluble in its modern phase as it was in the prehistoric ages”; but I should draw from the above admissions, with respect to the impotency of science, an argument in favour of a closer attention being paid to the soul and its phenomena, and also for the necessity of a revelation. Is there nothing “revealed” in God’s written book that is a “secret” to science? However, I think, when the “materialist is confounded, and science rendered dumb,” no sane man will ever again “decline to pray” to God, when cholera smites down by his side those whom he holds to be nearest and dearest. *Why* is the “connection” between body and soul severed by pain in so short a time, if that connection is not “necessary” in the eyes of science? Is “prayer” here, after all, suited for the philosopher as well as everybody else? I feel that I ought to apologise for beginning my subject by this digression; but so much has been said of late about the “clergy” and “theology,” that I am beginning to tremble for “science;” for it would be nothing short of a disaster if the British Association should take the place of a Church Congress or Synod.

ETHICAL PHILOSOPHY, ITS RELATIONS AND INTERACTIONS.

I will here draw attention to the *combination of different facts or phenomena*—the *combination of laws*—and some inferences pointing to a universal philosophy and the doctrine of one Supreme Mind and Intelligence.

What is ethical cannot be separated from what is physical and theological, very frequently. There is a brotherhood of truths, and they combine and interlace in such wonderful order that it is often difficult to separate or distinguish between them. Mind is connected with matter, and both have

to do with morals. Nature has many sides, and truth many relations. Our present danger lies chiefly in the tendency to obliterate some of these sides, to overlook some of these relations. This is the vice of the Positivist. We are told by him that every branch of knowledge leads the inquirer through three stages; that the mind, on seeing phenomena, first desires to know the *causes* at work producing such phenomena, then leaving causes, it seeks after *abstract forces*, and lastly, confines itself to *laws*,—"the God of this world, which blinds the minds of them that believe not." The process is described as first theological or supernatural, then metaphysical, and then scientific. Supernatural agency gives place to abstract forces, and abstract forces in turn give place to the laws of phenomena. The scientific or positive stage is final and exhaustive, it swallows up all the rest. So that what is theological or metaphysical passes into imagination, and the only thing that remains for certain, is science—a conclusion opposed to facts of both a subjective and objective character. The human soul has its presentative faculties, by means of which thought becomes possible. The external senses present phenomena of a material kind, upon which physical science is built. The psychological facts of human consciousness present matter out of which metaphysical philosophy is formed. And the internal moral sense presents the facts of approbation and disapprobation, which arise on seeing the actions of rational and voluntary agents, supplying us with a foundation for ethical philosophy. Neither science nor philosophy is possible apart from facts or special faculties. The senses take cognizance of material phenomena—the intellect of causes or abstract forces—and the moral sense of qualities, feelings, purpose, &c. There are, therefore, different stages of thought through which we pass in pursuing the objects of knowledge, and the soul has its different faculties answering to the different classes of truth presented, according as that truth is of a physical, metaphysical, or moral kind. The soul of man stands in a pre-established relation to those external sources of excitement which call up thought and emotion.

There is then room for distinction and discrimination, whether we look at the nature of man or the nature of things—whether we analyze the subjective feelings and impressions in the human soul, or the objective nature of the truths sought. Interaction and relation, indeed, necessitate the special consideration of these presentative faculties which act, and of those truths which are related to one another; for we can only arrive at a correct general view through a knowledge of particulars. Generalization is possible only through abstraction. But,

while physical, metaphysical, and moral philosophy must first be studied as separate and distinct, yet when we come to the events of daily life, we find facts belonging to all these classes of truth, not seldom in close combination—so close, indeed, that it is impossible to view these facts aright from either a physical, metaphysical, or moral point alone. To take a case for illustration, one which may afford scope for a few passing remarks, and, as having already engaged our attention in this *Institute*, as well as the pen of Dr. Tyndall in the *Fortnightly Review*,—I mean the case or the fact of miracles. To have restored to him the power of vision, the blind man must “receive his sight,” which is so far physical and phenomenal. But the observer of this phenomenon cannot rest satisfied with seeing it; his mind rises by its own native force and energy to the cause or causes which gave sight where before it was not. Here the observer passes from what is physical to what is metaphysical—his mind no longer dwells upon what is visible and tangible, but is seeking after some cause or unseen force. “The scientific mind” (says Dr. Tyndall—though I really do not know that this principle of curiosity is confined to ‘scientific minds,’—I rather think it is in full play among children) “can find no repose in the mere registration of sequences in nature. The further question intrudes itself with resistless might—Whence comes this sequence? What is it that binds the consequent with its antecedent in nature? The truly scientific intellect” (I have a fair-haired boy of five, whom I feel in danger of regarding as ‘truly scientific,’ for he bothers my very life out to know the cause of everything) “never can attain rest until it reaches the *forces* by which the observed succession was produced.” The student of natural science, like the child, is impelled, no doubt, by his very nature, and the discoveries he makes, to seek for truths in other departments of nature. A physical fact sets him off in thought to inquire for an unseen cause, a metaphysical explanation—“*philosophia est scientia rerum per causas primas, recto rationis usu comparata.*”

It is most interesting to know the relation of forces, and it was truly said, “not until this relation between forces and phenomena has been established, is the law of reason rendered concentric with the law of nature, and not until this is effected does the mind of the scientific philosopher rest in peace.” (Dr. Tyndall.) But I am tempted to remark in passing, that the “relation” ascertained, leaves force itself still in the dark. *What is force?* Does the “scientific philosopher” throw any light upon facts by the use of this word “force”?—as much as, but not more so than when he calls sensation an

affection of the "sensory," and intelligence the action of the "cerebral" *ganglia*. Philosophy wants not new names, but to know *what* force itself really is, *what* sensation is, *what* intelligence is, *what* thought is. These are questions that are not answered, in a philosophic sense, by a mere sophism or change of terms. Until we are told what force is, "the law of reason" cannot be said to be "concentric" with the "law of nature," and the mind of the philosopher, like that of the child, cannot "rest in peace." A miracle, like other phenomena, has its forces proximate and remote—and that which binds the consequent to its antecedent, is also here, as elsewhere, neither seen nor weighed. The theologian, therefore, may be said to be as much, but no more, in the dark, than the natural philosopher; for both are crying out in the old language of nature's felt wants, showing us how little we have, after all, as yet advanced, "Oh that I knew where I might find Him! that I might come even to His seat! . . . Behold, I go forward, but He is not there; and backward, but I cannot perceive Him: on the left hand, where He doth work, but I cannot behold Him; He hideth Himself on the right hand, that I cannot see Him." * *Force!* why who has ever tried to conceive what this word can mean further than his own conscious efforts of volition, as by a sort of figure, enable him? This very word, upon which so much empty eloquence has been lavished, is borrowed from personal agency and transferred by the natural philosopher to an impersonal, unseen, imponderable something, which he can neither see, nor hear, nor weigh. How then can he "rest in peace" by the mere transference of what, after all, may be, so far as he can prove, a misplaced title? "As I passed by and beheld your devotions, I found an altar with this inscription, to The UNKNOWN GOD." Might not St. Paul have said as much of "certain philosophers of the Epicurean" sort in this age? Force, so far from throwing any light upon the pathway of the natural philosopher, may be a word serving but to conceal from his gaze that light of heaven which in his pride or self-sufficiency he spurns. I say this *may* be so in some cases; it is not so in most cases: for example, Sir John Herschel regarded force—yes, even the "force of gravitation—as the direct or indirect result of *consciousness* or *will* existing somewhere." † But behind the phenomenal, there is not simply the cause or force producing it, but also, in the case of rational agency, purpose, qualities, &c.; in other words, that which is ethical or moral, that which arouses a third kind of operation in the beholder's mind. The miracle

* Job xxiii.

† *Outlines of Astronomy*, fifth ed., p. 29.

does this without any risk of "eating the Christian religion up." But as I am concerned with the interactions and relations of ethical philosophy, it is no business of mine here to notice Dr. Tyndall's remarks upon the ethical features of a miracle, nor the argument from ethical considerations in favour of miracles, nor yet to point out the illegitimacy of his criticism, which substitutes the word "doubtful" for the word "invisible," and then proceeds to argue upon the change of terms, as if it were warrantable. My present object is simply to show how the different faculties or powers of human nature are called into exercise by the different kinds of objective truths that interlace and confront us as we contemplate, very frequently, one fact or event as that of a miracle. This shows the interactions and relations of what is ethical, that "all things are double (as said the Son of Sirach), one against another."

And as *facts*, viewed in their isolated character, present this complication of truths, it is the same with *law* in its interlacings and workings. Each separate branch of philosophy has, of course, its own system of laws; yet law, in the sense of order, may be said to be common to all branches of philosophy. There is an order of thought as well as an order of material sequence. And there is also an order of wisdom, purity, and rectitude. When I have spoken of miracles as coming under a system of moral law, I have been asked, "Do you in fact use the term law in the same sense as when you speak of physical law?"* and I am bound to say that I do. Law denotes *order*, not *force*, and it is common to all branches of philosophy, metaphysical, moral, and material. It is, in fact, only through material organization and arrangement that moral truth is made intelligible to man. Every one truth is connected with some other truth, and every distinct law in nature has its relation to some other law, and so each system of laws appears to bear an appointed relation to the universal cosmos. Every result, therefore, in nature may be regarded as the consequence of a balancing of contrariant forces. That which comprehends all things is not the science of the Positivist, but the philosophy of the metaphysician. Metaphysical philosophy has to do with the whole of things, their principles and causes; it seeks to blend into a harmonious whole that which is common to all branches of philosophy, but peculiar to none. Hence it was justly termed, in ancient times, the first or universal philosophy.

But the interactions and relations of ethical philosophy

extend beyond the natural to the sphere of the supernatural, if miracles are to be included. And why not take in Revelation and Christianity—whole and entire? I will quote a passage here in reference to miraculous agency from Principal Tulloch:—

“The stoutest advocate for interference can mean nothing more than that the supreme Will has so moved the hidden springs of nature that a new issue arises on given circumstances. The ordinary issue is supplanted by the higher issue. The essential facts before us are a certain set of phenomena, and a higher Will moving them. How moving them? is a question for human definition; but the answer to which does not and cannot affect the Divine meaning of the change. Yet when we reflect that this higher Will is everywhere reason and wisdom, it seems a juster, as well as a more comprehensive view, to regard it as operating by subordination and evolution, rather than ‘interference’ and ‘violation.’ According to this view, the idea of law, so far from being contravened by the Christian miracles, is taken up and made their very basis.”*

The Christian miracles are but a species of the supernatural, like prayer, regeneration, conversion, and the fundamental doctrine of atonement. And I venture to think that the interactions and relations of ethical philosophy extend to all these forms or phases of the supernatural. In the great central fact of atonement, we see the highest form of that friendly help and mediation, which, by nature, God has taught us to render to each other. In the spiritual regeneration of the soul, we see that new birth into the Church of God in which the child is as helplessly passive as when nature gave it to the world. In the spiritual conversion of the sinner to God, we see a return bearing a strict analogy to that of the reckless son who came first to himself and then to his father. In that great principle of action, faith, we see an extension to what is spiritual, of that confidence, which, by nature, man was formed to repose in his fellow-man. In fact, the whole system of Christian edification is governed by those same general laws of assimilation, according to which we become like those we love, and with whom we associate. The same great principles of social and personal morality which interpenetrate the natural, extend also to the system of the supernatural. In short, the relations and interactions of ethical philosophy may be said to be universal, showing us that all truth originates in God, and that ethics, physics, metaphysics, and theology, natural and revealed, have one common source. Nay,

* *Beginning of Life, &c.*, pp. 85, 86.

passing from the region of subjective facts in Christian experience, I seem to find in the ritual or objective form of worship prescribed by God in the Old Testament, not that which is unphilosophical or superstitious, but an application to Divine worship of those very principles of æsthetics which Kant, Hegel, Schelling and Fichte have sought to apply in philosophy. There is such a thing as "the beautiful" in religion as well as in philosophy, such a thing as worshipping God "in the beauty of holiness."* There is a Christian as well as a natural philosophy. The same great principles, the same eternal and immutable laws of morality, underlie what is natural and supernatural, showing us that these are but distinct species of truth under some common genus, and therefore indices of one supreme mind and intelligence.

Law "reigns" everywhere. The Duke of Argyll, in what has been termed "a delightful book," says —

"I had intended to conclude with a chapter on 'law in Christian theology.' It was natural to reserve for that chapter all direct reference to some of the most fundamental facts of human nature. Yet without such reference the reign of law, especially in the realm of mind, cannot even be approached in some of its very highest and most important aspects."†

The Duke shrunk from the task of completing his design, because it would have brought him face to face with "questions so profound, of such critical import, and so inseparably connected with religious controversy." Yet I feel persuaded that nothing will tend more to allay religious controversy, than a faithful consideration of the mutual bearings of different branches of science or philosophy, referring them as branches to some more "comprehensive and fundamental principles" based upon "faith in one Eternal God." With this persuasion it is that I have prefaced my remarks upon ethical philosophy proper, with some more general observations upon its interactions and relations. The consideration of the mutual bearings of the different branches of science and philosophy was a main object with this Society, as stated at its foundation, yet I am not aware that a paper has yet been contributed with this end specially in view. Might not some member take up the subject of "Metaphysics" not in the absurd sense of the schoolmen, but as embracing what is more general in nature, — principles, and the whole of things? "Leaving particular subjects and their several properties to particular sciences, this universal science compares these subjects together; considers wherein they differ and wherein they agree; and that which

* 1 Chron. xvi. 29.

† *Reign of Law*, Preface.

they have in common, but belongs not in particular to any one science, is the proper object of metaphysics."* The Duke of Argyll spoke of law in five senses, in the book referred to; from the "lowest sense" in which the term can be employed he comes up to a "higher sense," then one "more exact and definite," and lastly to "purpose," "function," "abstract conceptions," in other words, to will and intelligence. From what is purely physical he passes to what is moral and metaphysical—the idea of law or order carrying the mind upwards, till order itself brings the writer face to face with the fact or doctrine of one Supreme Will and Intelligence.

ETHICAL PHILOSOPHY PROPER, CONSIDERED AS A DISTINCT BRANCH OF STUDY.

Ethical or moral philosophy is the science of right and duty—the "habit of virtue," according to Aristotle—"the art or science of living well," according to Cicero—the "science which relates to our mutual affections, not simply as phenomena, but as they are virtuous or vicious, right or wrong," according to Dr. Thomas Brown—and that "science which is founded on that hitherto unnamed part of the philosophy of human nature (to be constantly and vigilantly distinguished from *intellectual* philosophy) which contemplates the laws of sensibility, of emotion, of desire and aversion, of pleasure and pain, of happiness and misery; and on which arise the august and sacred landmarks that stand conspicuous along the frontier of right and wrong," according to Sir James Mackintosh.

In speaking of moral law as a system, of course what is material is not excluded, but subordinated to the higher aims of wisdom, justice, purity, and order. And if ethical philosophy has its foundation, as I believe it has, in facts of human nature, then it has not been, and cannot be, superseded by revelation. I say this because there is a feeling—I am sure it is only a feeling—that however useful ethical philosophy may have been in ages before Christianity was given to the world, now that it has been given, there is no further need of this once special department of study. And perhaps this may be one reason why it forms so small a part of the curriculum of study prescribed for the learned professions. In Oxford it is not required for a degree, though Aristotle and Plato are read. In Cambridge it is relegated to the few who aspire to the distinction which the moral sciences

* Monboddo, *Ancient Met.*, book iii. ch. 4.

tripos offers. In Dublin, I believe, Stewart's "Outlines" are got up. In London, a few books of one-sided and utilitarian bias are, or have been, prescribed. In Durham it is not thought of, or in any of the theological colleges. In Scotland more attention is paid to it, for it forms part, I believe, of the curriculum in all the universities for ordinary graduation. But it is a grave error to suppose that it has been, or can be, superseded by the utterances of revelation. To say that it has been, or can be, superseded, is to affirm either the uselessness of its facts as a department of study, or to deny that it furnishes of itself and alone a legitimate object of study at all. But it rests upon *facts* in human nature, and this is not an age when any facts ought to be left unnoticed. Our duty is to investigate, and take the consequences of investigation. If this course land us in results that do not seem to harmonize with the utterances of revelation, then, before we proclaim any discrepancy, let us remember that we are not infallible, and begin to verify every step of the course we have taken. I feel persuaded that in principle, and in facts of detail, the New Testament will be found an exponent of the purest ethics.

THE SPRINGS OF MORAL ACTION.

"But do not those impulses which lead and urge men forwards, spring from affections and evils?"—*τὰ δὲ αἰγούρα καὶ ἔλκοντα δὲ παθημάτων τε καὶ νοσημάτων παραγίγνεται*.* Aristotle, referring to Plato's classification, mentions five powers of the soul,—the vegetative, the sensitive, the appetitive, the motive, and the intellective, and this did not add to his own clearness or perspicuity upon the subject. Plato's "reason, desire, and anger,"—desire being manifold in form, was a better classification. But human actions may be said to spring from certain impulses of an implanted kind, such as those which underlie instinct, appetite, desire, passion, emotion, affection, disposition, and opinion. Disposition and opinion are not, as manifested among men, implanted, still they exist in all in a primitive type or form, ready for development when external circumstances call them forth. And here I may remark that experience and observation, as regards these parts or facts of human nature, wonderfully coincide with the statements of revelation. With the greatest accuracy we might take up these statements and compare

* *R.-pub.*, lib. iv. cap. 15.

them with actual experience, and we should be constrained to say "O Lord, Thou hast searched me and known me. Thou knowest my downsitting and mine uprising, Thou understandest my thoughts long before. Thou compasses my path, and art acquainted with all my ways." * In the parables and addresses too, recorded in the Gospels, the Founder of Christianity appealed to the springs of human action in such a manner that we cannot fail to see the truth of that statement, "He needed not that any should testify of man; for *He knew what was in man.*"† Even judged from a human point of view only, our Lord's knowledge of human nature was marvellously perfect or philosophical. And as ethical facts and revelation here agree, so it may be said that the difference among men is small as regards the place these springs or primary motives occupy in our moral nature. Plato's little state or republic had its appetites and passions to trouble it, its "irrational parts," the "unruly wills and affections" of the Prayer-book, where will is used in the sense of *desire*, as Priestley, Bentham, James Mill, and Dr. Brown have erroneously used it—but the disturbances occasioned by these parts of human nature have been such as to call for the interference of the police officer rather than the philosopher. It is when we come to the higher regulative powers of reason and conscience, and the nature of virtue, that we find philosophers most at variance with each other.

THE REGULATIVE PRINCIPLES OF MORAL ACTION.

The springs of action excited, it is the office of the higher powers to regulate human conduct, reason giving to man a sense of prudence, enabling him, that is, to select right means, and conscience giving to him a sense of duty, or aiding him in the selection of right ends.

It will not, I presume, be expected that I should here enter into all the points of disputation that have arisen in reference to the nature and functions of reason and conscience. Aristotle was right when he separated morality from what is strictly intellectual or speculative. The reason, of course, has an office to fill, but in morals it is directive, not motive, practical, not speculative. How far it enters into the subjective operations of the conscience or moral faculty I will not take upon me to say further than this, that it seems to hold a posterior

* Ps. cxxxix.

† John ii. 24, 25.

rather than a prior office in our moral perceptions. And for this reason, if virtue as an object be presented to the mind as an individual thing, and not as a general notion, then it must be cognizable by some proper sense and not by the reason or intellect, for reason implies an exercise of thought. Virtue as an individual thing, to come within the field of possible experience, would seem to require a moral sense to discern it, just as colour requires the sense of sight to perceive it. When it has been seen or perceived, virtue no doubt may give rise to comparison and general notions, and so provide material for the exercise of the reason; but the question is, how is virtue as an object perceived in the first instance? Can the reason grasp an external object without a proper sense to bring it within its reach? Ideas of right and wrong are simple and intuitive, they provide materials for the exercise of reason; but it seems to me that without an intuitive moral faculty we could never have such ideas at all. In our moral researches, therefore, I should feel disposed to assign to the reason an office posterior to that of a moral sense. Conscience includes both, no doubt; but feeling takes precedence of the reason in its exercise, rather than the reason precedence of feeling.

THE EFFICIENT CAUSE OF HUMAN ACTION.

The appetites, desires, affections, &c., forming that part of human nature called the sensitivity, were designed to be under the direction and control of reason and conscience. Yet these springs and guides are also dependent upon the *will* as the last link in the chain of intention and the first of action. But what is volition? how comes it to pass? Do the sensitivity and intellect invariably guide and *necessitate* the will? We are supplied with motives through the sensitivity. We acquire, retain, and extend our knowledge through the intellect. In what, then, consists the act of volition? How stands the will in its relations to the sensitivity and intellect? Is it controlled? or does it control? Is it in bonds? or does it act freely?

There is law, doubtless, an order of working, in the realm of mind, as well as in the world of matter. Indeed the two worlds are here very wonderfully connected. Material organization is made not only to assist the operations of mind, but the faculties of mind depend upon material organization for the performance of their functions. The power of mind is

found to be commensurate with the strength or degree of cerebral organization. Yet thought is not cerebration, but something which runs along by means of it. Sensation is distinct from the "sensory ganglia" or nerves, yet it is made possible through them as instruments. The mind or soul is made to depend upon physical conditions, and the slightest disarrangement in our material economy may derange the whole of our mental operations, and throw the laws of the human soul into confusion. But nothing is hereby proved, nor even suggested, as to the non-existence of soul as a distinct part of man. Confusion may take the place of order, but this proves nothing against, if it does not in favour of, the soul's separate existence. The will, which has been termed the efficient cause of action, like other parts of the human constitution, has its relations to the whole framework. What are these relations? Much controversy has been excited by this question. Indeed, the difficulties suggested by the Will and its relations to the human framework, have been increased, by adding to them the further difficulty of reconciling the foreknowledge of God (which is a distinct question altogether) with human freedom, supposing it to exist. Predestination has been linked with the problem of free-will, and these together have supplied Mahometans, Jews, philosophers, and divines, in ancient and modern times, with matter of contention that has been pronounced inexhaustible. That motives act upon the will is a fact as certain as that we have springs of action within us. To deny this would be to render a philosophy of ethics impossible.

The forces or motives acting upon the will are various in nature and in their degrees of strength. The aggregate of these forces, or motives, which are all but endless in number and variety, may be said to move the will to action. We know not their number, we see not their character, and therefore we cannot estimate their resultant force or direction. Not that such force or direction is to be calculated as forces in mechanics, else we might suppose a person impelled by a given weight or number of motives to go a certain distance in one direction, say to the north, while an equal weight or number of motives were pulling him in another direction, say to the east; in which case he would exhibit the singular perverseness of obeying nothing and nobody, by walking straight off in a diagonal, halfway between the two points, towards which we have supposed him at the same time to be impelled. There is a difference between mechanics and living agency. The law of necessity is admitted to guide things without life; the law of freedom, it is contended, guides

creatures that have life. Brutes have freedom in a prescribed groove. And the higher we get in the scale of intelligence, the wider is the groove of freedom assigned. Man, the crowning work of creation, has a larger freedom than the brutes, corresponding to his higher order of intellect. This shows that motives stir the man, but do not govern or control him. The higher the regulative powers, the wider is the freedom. And here I feel myself compelled to take exception to a passage which I shall quote from the Duke of Argyll's *Reign of Law* :—

"Accordingly we may see that, in proportion as there is an approach among the lower animals to the higher faculties of mind, there is, in corresponding proportion, a difficulty in predicting their conduct. Perhaps the best illustration of this is a very homely one—it is the effect of baits and traps. Some animals can be trapped and caught with perfect certainty ; whilst there are others upon which the motive presented by a bait is counteracted by the stronger motive of caution against danger, when a higher degree of intelligence enables the animal to detect its presence. Yet the will of the cunning animal is not more free than the will of the stupid animal ; nor is the will of the stupid animal more subject to law than the will of the cunning one. The will of the young rat which yields to the temptation of a bait, and is caught, is not more subject to law than the will of the old rat, who suspects stratagems, resists the temptation and escapes. They are both subject to law in precisely the same sense and in precisely the same degree—that is to say, their actions are alike determined by the forces to which their faculties are accessible. Where these are few and simple, the resulting action is simple also ; where these are many and complicated, the resulting action has a corresponding variety. Thus the conduct of animals is less capable of being predicted, in proportion as it is difficult or impossible to foresee the number or nature of the motive forces which are brought to bear upon the will. Man's will is free in the same sense, and in the same sense only. It is subject to law in the same sense, and in the same sense alone. That is to say, it is subject to the influence of motives, and it can only choose among those which are presented to it, or which it has been given the power of presenting to itself." *

With the facts here posited there is no room to disagree. With the *inference* drawn, that an equal freedom only is enjoyed in an ascending scale of intelligence, I must differ. I fail entirely to see its legitimacy, or the grounds for the assertion "the will of the cunning animal is not *more* free than the will of the stupid animal." Man, it is admitted, has the "power of bringing to bear upon himself motives, arising out of his power of forming abstract ideas, out of his pos-

* *Reign of Law*, pp. 332-3.

session of beliefs, and above all, out of his sense of right and wrong." And, further still, it is admitted—

"Among the motives which operate upon man, he has a *selecting* power. He can as it were compare them among each other, and bring them to the test of conscience. Nay more, he can reason on his own character as he can on the character of another being—estimating his own weakness with reference to this or the other motive, as he is conscious how each may be likely to tell upon him. When he knows that any given motive will be too strong for him if he allows himself to think upon it, he can shut it out from his mind, 'keeping the door of his thoughts.' He can, and he often does, refuse the thing he sees, and holds by another thing which he cannot see. He may, and he often does, choose the invisible in preference to the visible. He may, and he often does, walk by faith and not by sight. It is true that in doing this he must be impelled by something which in itself is only another motive; and so it is true that our wills can never be free from motives, and in this sense can never be free from law."*

No man contends for freedom from motives, nor freedom from law. The contention is, that there is power of *control* over motives, not *freedom* from them, and that this power of control is greater in proportion to the higher character of intellect. Why is the old rat more difficult to catch than the young one, who falls a victim to the bait the first go-off? Because, says the Duke, the "motives" or "forces" at work are more numerous, and consequently the action more uncertain and less easy to calculate. But this is not the *whole* truth; experience has made the old rat, like the old bird who sees chaff, more wary; he is more intelligent, better instructed, and with his advance in the power of intelligence, he becomes *more* free—freedom keeping pace with increasing intellectual power. It is so with the child as it grows up from infancy of knowledge to an acquaintance with men and things. There spring up with its growth, not simply an increase of the number of motives, but of the power of "selecting" from among the number present at a given time, the power also of dismissing those that are present, and of calling up others which were not present; and this power is just that for which we are contending—*freedom*. The connection between the enlarged number of motives in the adult rat and the enlarged groove of freedom, appears to have led the Duke of Argyll to argue occasionally as if the will were *necessarily* swayed by the motives present at the time, whether such motives be many or few. But this cannot be the case with man, who is admitted to have the power of "selecting," and calling up

* *Reign of Law*, pp. 334-5.

and putting down motives at will—"he keeps the door of his thoughts"; his thoughts or motives do not keep him—that is to say, he has *control* over his motives; his motives do not control him, which is all the freedom that is contended for.

But it is said, "the will can only choose among those motives which are presented to it, or which it has the power of presenting to itself." *Choice*, however, in any form, implies *freedom*, and the freedom of choice here is wide, for this "power of presenting to himself motives," which man has, is incalculable, if not unlimited.

But if we could calculate, it seems to be put hypothetically, the number and weight of motives which are "presented," and which man has the "power of presenting to himself," then volitions could be foreseen, and we could calculate the course of conduct that would follow. If we could tell beforehand how a man would reason with himself, what motives he would dismiss, what he would call up, no doubt we could tell how he would act. But why not say, in plain language, that if we knew beforehand what his course of conduct would be, we could tell other people what it would be? This is all the argument really amounts to.

So hard, however, is it for man to be reasonable when he undertakes to discuss free will, that the Duke of Argyll has actually said, that in calling up one motive and putting down another, man is "*impelled* by something which in itself is only *another motive*, and so it is true that our wills can never be free from motives, and in this sense can never be free from law." Jonathan Edwards would have an "antecedent volition" to produce every given volition, and so on to all eternity. The Duke of Argyll first invests man with the power of calling up one motive, putting down another, making a "choice" or "selection" from those which remain, and I had fancied that this was *freedom*; but it now seems that "selection" was not what we ordinarily mean by that word, for man was "*impelled*" to "*select*" or "*choose*" by something else, "which in itself is only another motive." This is tiresome, like most arguments in a vicious circle; and I do think his Grace, in the next edition of his *Reign of Law*, should define his terms and use them consistently. Ho is very hard upon Mr. J. S. Mill, for "ambiguities and obscurities of language,"—is it unreasonable to ask what an "*impelled*" "choice" or "selection" of motives was intended to mean?—and if in "selecting" or "choosing" one motive in preference to another, if in dismissing this and calling up that, if in "keeping the door of his thoughts," man is really "*impelled*" by "something else," is it too much to

ask what that "something" is?—and if that something be "only another motive," may it not be demanded *how* it came to be where a moment before it was not? In arguing against such a common fact of every day's experience, as human freedom, it is incumbent upon the writer to state his grounds for so doing. The Duke of Argyll, under pretence of upholding freedom, has fallen into the argument for necessity; but I cannot find that he had any grounds for so doing, further than a fallacious use of words in opposite senses, and a hypothetical assumption of facts which cannot be proved to have existence.

On page 13 of the *Reign of Law* it is said:—

"The same lecturer (Dr. Tyndall) who told his audience that there was nothing spontaneous in nature, proceeded, by virtue of his own knowledge of natural laws, and by his *selecting* and combining power, to present a whole series of phenomena—such as ice frozen in contact with red-hot crucibles—which certainly did not belong to the 'ordinary course of nature.'"

But if "selection" of motives is to be explained by "something else," which is "only another motive," "*impelling*" man to make the selection, was not Dr. Tyndall right, after all, when he began, as the Duke of Argyll says he did?

"Not long ago a course of lectures on the phenomena of heat by a rapid statement of the modern doctrine of the correlation of forces—how the one was convertible into the other—how one rose out of the other—how none could be evolved *except from some other as a pre-existing source*. Thus (said the lecturer) we see there is no such thing as spontaneousness in nature."³

The Duke of Argyll exclaims "What! not in the lecturer himself? Was there no *spontaneousness* in his *choice* of words—in his *selection* of materials—in his orderly arrangement of experiments with a view to the exhibition of particular results? It is not probable that the lecturer was intending to deny this; it simply was that he did not think of it as within his field of view. His own mind and *will* were then dealing with the laws of nature, but it did not occur to him as forming part of those laws, or in the same sense, as subject to them." But if the Duke is right in his chapter on the "*Reign of Law in the Realm of Mind*," Dr. Tyndall could not have been far wrong in saying "there is no such thing as spontaneousness in nature." *Spontaneity*, like choice, is not compatible with the doctrine of "another motive" *impelling* it; but "another motive" *impelling* it is in harmony with the "modern doctrine of the correlation of forces." A "spiritual antecedent" is

* *Reign of Law*, p. 7.

just that which excludes "spontaneity," "choice," or "will," and makes good the doctrine of Dr. Tyndall, against which the Duke of Argyll argues on page 7, and in favour of which he writes on pp. 334-5 of the *Reign of Law*.

I feel that I ought to apologize for criticising thus far a work which has received so much praise from the *Times* newspaper downwards, and which the President of the Royal Astronomical Association called a "delightful book." But while I can say most truly that I have myself felt great delight in reading it over, and can most heartily enter into and go along with much that it contains, I have always thought that its weakest chapter was that on the "Reign of Law in the Realm of Mind," and that its weakness consists in its being neither consistent with itself, nor with the rest of the book which contains it.

THE NATURE OF VIRTUE.

The active and moral powers of man, or the springs and guides of action, have their correlative *virtue*. What is this?

The various answers to this question, which have been given in ancient and modern times, have been classified according as the different authors have placed the foundation of virtue in the nature of things or in the nature of man. My subject, namely, "Ethical Philosophy and its *relations* to Science and *Revelation*," naturally directs to the New Testament, from which Mr. John Stuart Mill has said, "it has never been possible to extract a body of ethical doctrine."*

If by a "body of ethical doctrine," is meant, in this quotation, a body of *rules*, I should agree with its author, for it is not the business even of the philosopher to lay down rules, ethical philosophy being a science of facts, and not a body of rules. But if it is meant that the New Testament does not contain the *principles* of a pure philosophy, then I would join issue with Mr. Mill and challenge him to prove his position.

The Founder of Christianity sought to stir up morality by an appeal to the springs of moral action; *love for mankind* (*ἀγάπη=φιλανθρωπία=humanitas*) being the foundation of virtue which He laid down; not love for beings in general, as Jonathan Edwards absurdly put it, but love for the *race*, love for man *as man*. He worked not upon the heads, but upon the hearts of men. Other teachers may have proposed a body

* *On Liberty*, people's ed., ch. ii.

of rules, and given to man reasons for them; Christ's was a more philosophic way. He entered into the chamber of the heart, touched the *springs* of action with a holy fire, and thus sought to establish practical morality by kindling up an enthusiasm for the race. "Make the tree good" was the way by which He sought to obtain "good fruit." And in this His teaching was strictly philosophical. Not that I mean it to be understood for one moment that the doctrines of grace are or can be superseded; what I mean is this, that grace is made to work in man's moral nature *as God has formed it*. The powers of reason are treated by the Founder of Christianity as regulative merely, and the mere intellectualist, such as Mr. Mill, misses the root of the matter when he seeks to build up an ethical system upon merely rationalistic grounds. The springs of moral action are seated in the affections,—the sensitivity, to use a good general term; and they have their incentive, their correlate in "whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, and whatsoever things are of good report," which St. Paul bade the Philippians "think on," if there be any such thing as *virtue*.

No doubt it may be said that such an object as virtue, pure and simple, is hardly, if ever, seen among men. But it was seen, I believe, in the person of Christ. And it is worthy of remark that He, the great Moral Teacher, who is called the "Son of man," the type of mankind in its pure form, was the very *object* which He bid his followers look at. Individual cases were to be viewed as through Him, the perfect type. To feed the hungry was to be regarded as feeding *Him*. To visit the afflicted and relieve the needy is called the visiting and relieving of *Him*. "*I was an hungered, I was thirsty, &c.*" Thus we find the active and moral powers of man directed in theory to a perfect objective model of virtue. Christianity is hereby shown to be not simply practical but sublimely ethical. It strikes an inward personal chord, which is *love*, and it points to the establishment of a universal brotherhood, where the ruling principle shall be a spirit of universal benevolence. To lay hold of these great principles is to have, in an ethical sense, "Christ formed within," to advance to the "measure of His stature;" that is to say, ethical perfection.

Now of all the systems of virtue, the theories propounded respecting it, there is not one that can be said to rival the teaching of Christ. But there is one which comes very near to it,—I mean the eclectic system of the Platonists, which, after the age of Augustus, made virtue consist in *benevolence*. Dr. Adam Smith thus describes it:—

"In the Divine nature, according to these authors, benevolence or love was the sole principle of action, and directed the exertion of all the other attributes. The wisdom of the Deity was employed in finding out the means for bringing about those ends which His goodness suggested, as His infinite power was exerted to execute them. Benevolence, however, was still the supreme and governing attribute, to which the others were subservient, and from which the whole excellency or the whole morality, if I may be allowed such an expression, of the Divine operations was ultimately derived. The whole perfection and virtue of the human mind consisted in some resemblance or participation of the Divine perfections, and consequently in being filled with the same principles of benevolence and love which influenced all the actions of the Deity. The actions of men which flowed from this motive were alone truly praiseworthy, or could claim any merit in the sight of the Deity. It was by actions of charity and love only that we could imitate, as became us, the conduct of God; that we could express our humble and devout admiration of His infinite perfections; that by fostering in our own minds the same Divine principles, we could bring our affections to a greater resemblance with His holy attributes, and thereby become more proper objects of His love and esteem, till at last we arrived at that immediate converse and communication with the Deity to which it was the great object of this philosophy to raise us."*

In this beautiful passage I seem to find the very soul of New Testament teaching. Dr. Adam Smith proceeds:—

"This system, as it was much esteemed by many ancient Fathers of the Christian Church, so, after the Reformation, it was adopted by several divines of the most eminent piety and learning, and of the most amiable manners, particularly by Dr. Ralph Cudworth, by Dr. Henry More, and by Mr. John Smith, of Cambridge. But of all the patrons of this system, ancient or modern, the late Dr. Hutcheson was undoubtedly, beyond all comparison, the most acute, the most distinct, the most philosophical, and, what is of the greatest consequence of all, the soberest and most judicious."†

The late Dr. Whewell has also said:—

"Since virtue or goodness must be a law and a disposition which binds man to man by the tie of a common humanity, and excludes all that operates merely to separate men, all affections which tend to introduce discord and conflict; it excludes malice and anger, as we have said, and directs us to mildness and kindness. The absence of all the affections which place man in opposition to man, and the aggregate of all the affections by which man clings to man, may be expressed by the term *benevolence*, understood in its widest sense. 'All these dispositions, Benevolence, Justice, Purity, and Order, may be conceived to be included in a love of goodness.'‡

* *Theory of Moral Sentiments*, part vii. ch. iii.

† *Ibid.*

‡ *Elements of Morality*, book ii. ch. ii.

Here, then, we find the ethical principles of the New Testament in exact accord with the purest and best which philosophers have laid down, or rather I ought to say, the purest and best which philosophers have laid down accord with those of the New Testament. "*Love*" (*ἀγάπη*, equivalent to *humanitas* and *φιλανθρωπία*) "is the fulfilling of the law"; "subjective humanity" being, as Dr. Whewell affirmed, *benevolence*, and "objective humanity," *the good of mankind*.

Having thus far shown that there is an agreement, as to main principles, between New Testament teaching on the subject of virtue and that of the best philosophers, I will compare its teaching first with the more ancient doctrine of Plato and Epicurus, showing its practical agreement with and superiority over them, and secondly, with the recent utterances of Mr. J. S. Mill in his "*Essay on Liberty*."

I will not refer to the main principles or theories of virtue held by Plato, Aristotle, Zeno, and Epicurus. I choose rather to take up details, and show that what was good in the systems of Plato and Epicurus, the most opposed of the ancients, is to be found in the New Testament. Plato's little state or republic, with its reasoning, irascible, or concupiscible parts (its *λογιστικὸν*—τὸ *θυμικὸν*—and *ἐπιθυμητικὸν*) working in due order and subordination, is not displaced by the teaching of Christ and His Apostles. Neither is that of Epicurus, with its pleasure on the whole and in the long run, as the one object to be desired, and its pain on the whole and in the long run, as the one object to be shunned, altogether put aside. True love as the spring or motive to action does not set the different parts of man's moral nature in battle-array among themselves. Neither does it lead us to prefer pain to pleasure, on the whole and in the long run. Right principles must lead to happiness in a world that is governed by infinite wisdom and goodness, and therefore rectitude and utility have points of contact in actual practice. If we take the four cardinal virtues, alluded to in the apocryphal book of Wisdom (viii. 7), and taught as main principles by ancient heathen philosophers, we shall find much of practical agreement between the New Testament, Plato, and Epicurus.

Prudence, said Plato, consists in a clear discernment of right ends to be attained, and the selection of right means leading to right ends—Epicurus, that it consists in seeking the greatest good and avoiding the greatest evil—the New Testament, that it consists in a man's "losing his life" for the truth, in "forsaking all" to further the Gospel. Plato was guided by wisdom—Epicurus by desire for happiness—Christ by goodness. And what have we here but three sides of an

ethical triangle, the only question being to find its true area and relations? There is no distinct opposition.

Fortitude, said Plato, consists in maintaining a spirit of honour and magnanimity—Epicurus, that it consists in braving smaller dangers with a view of escaping greater—Christ, that it consists in going into Judæa again, to the post of duty, whither the Jews lately sought to stone Him—and St. Paul, that it consists in that “ecstasy of charity,” which led him to say, “I could wish that myself were accursed from Christ for my brethren, my kinsmen according to the flesh.” Here, notwithstanding the difference which that “life and immortality” which the Gospel brought to light, must have made, we find that Plato assimilates very closely to Christ and His Apostles.

Temperance, said Plato, consists in the proper subordination of the lower parts of human nature to the higher—Epicurus, that it consists in curbing the appetites with a view of attaining higher and more lasting gratification—the New Testament, that it consists in extending to the very *thoughts* and intents of the heart, the prohibitions of the ancient moral code, in “bridling the tongue,” in “keeping under the body, and bringing it into subjection.” The Platonic and the inspired teaching here very closely agree.

Justice, said Plato, consists in the three subjective parts of the soul or nature of man (like the different parts of a state), so working together in their several offices as not to infringe upon that of each other—Epicurus, that it consists in uprightness and honesty towards others, because the reverse would bring shame and disgrace—the New Testament, that it consists in “doing unto others as we would they should do unto us,” in “rendering unto all their due, tribute to whom tribute is due, custom to whom custom, fear to whom fear, honour to whom honour.” Aristotle brought the teaching of Plato into still closer conformity with the New Testament by making virtue consist in a practical *habit*. Love, however, as the mainspring, to be seen in these New Testament details, is not so clearly to be gathered from Plato and Epicurus. It is in fact *not there*. The agreement is one of a practical rather than a theoretical kind, in details rather than in first or foundation principles. But this shows the superiority of New Testament ethics over other systems, and it brings me to Mr. Mill's views. He says:—

“I wonder that any one who derives his knowledge of morality from the New Testament can suppose that it was announced or intended as a complete doctrine of morals.”*

* *On Liberty*, p. 28.

It was certainly never "announced" as a treatise on Ethical Philosophy, nor was it "intended" to embody a complete system of rules. But it most certainly embodies the true *principles* of morality; indeed, religion, pure and undefiled, could be taught upon no other basis. But Mr. Mill advances to a more direct charge:—

"I do not scruple to say (he adds) that the New Testament morality is in many important points incomplete and one-sided, and that unless ideas and feelings not sanctioned by it, had contributed to the formation of European life and character, human affairs would have been in a worse state than now they are." *

It is difficult to meet this charge, because it does not say in what sense New Testament morality is "one-sided;" but if it is *fundamentally* right, while Plato and Epicurus are not, which I have maintained, then from a good foundation there cannot arise unsoundness. But Mr. Mill's meaning comes out perhaps in the following sentences:—

"Christian morality, so called, has all the character of a reaction; it is, in great part, a protest against Paganism. Its ideal is negative rather than positive; passive rather than active; innocence rather than nobleness; abstinence from evil, rather than energetic pursuit of good; in its precepts (as has been well said) 'thou shalt not' predominates over 'thou shalt.'"

It is curious that another recent writer of sceptical views should have drawn a picture the very opposite of this from the pen of Mr. J. S. Mill. *Ecce Homo*, therefore, shall defend the New Testament here in my stead. Its author says:—

"Christ raised the feeling of humanity from being a feeble *restraining* power, to be an *inspiring passion*. The Christian moral reformation may be summed up in this—humanity changed from a restraint to a *motive*. We shall be prepared, therefore, to find that while earlier moralities had dealt chiefly in *prohibitions*, Christianity deals in *positive commands*. And precisely this is the case, precisely this difference made the Old Testament seem antiquated to the first Christians. They had passed from a region of *passive* into a region of *active* morality. The old legal formula began '*thou shalt not*,' the new begins '*thou shalt*.'"

And then he gives proofs in detail. (See pages 175, 176 of his book.)

It is impossible for two authors to contradict each other in more express terms, and the only way I can account for Mr. Mill's statements, which every one acquainted with the New Testament must know to be untrue, is this, that he had not

* *On Liberty*, p. 29.

seen such a book for a long time when he wrote his *Essay on Liberty*.

The "greatest happiness" principle of Mr. Mill is certainly not to be found in the New Testament; and it may have been this which led him to speak of its ethics as "incomplete and one-sided." But then the Utilitarian theory, ancient or modern in form, has never made out its claim as yet to be sound. We look at actions, not at their consequences, when we speak of them as virtuous. It is the intention of the agent, rather than the benefit conferred, which leads us to admire what he does. The tree which supplies us with fruit, or the animal which renders us good service, does not awaken our sense of gratitude, like the kind and benevolent actions of a fellow-creature. Why not? because it is not the benefit conferred, but the motive or sense of duty implied, which constitutes the action virtuous, and awakens its corresponding feeling of gratitude and approbation. The facts of human consciousness give the lie to utility—right is not the same as benefit.

But I should gather from Mr. Mill's essay that truth on all points must continue to be an open question. His great principle appears to be a mere beating out of human brains in a sort of intellectual prize fight. The truth, of course, might, some day, come off victorious, but a lie is just as likely to triumph. Nay, as fools always outnumber philosophers, the stern logic of "liberty," of "individuality" as elements of "well-being" in the realm of thought, would seem to give an easy triumph to the omnipotence of numbers. But this could hardly matter, for we are told that—

"We can never be sure that the opinion we are endeavouring to stifle is a false opinion, and if we were sure, stifling it would be an evil still."

I am no advocate for "stifling," but I do think that we can never be sure when we hold what is true, if this last quotation contains what is sound. Still, Mr. Mill talks of things "no longer doubtful," and of the "fatal tendency of mankind to leave off thinking," as being the cause of half their "errors." But how he reconciles these statements with what goes before, namely, that "we can never be sure that an opinion is false," is not shown. I must, however, say that this uncertainty of opinion is not a goal worthy of man's unceasing mental exertions, nor an end such as we may reasonably conclude the Divine Wisdom has planned for His creatures to strive after. I think we can be sure that some opinions are false, and that the truth was never intended to remain an

insoluble enigma. In a moral point of view, I could not conceive of a more unphilosophical system of ethical dry-bones than that which Mr. Mill offers with such a sublime indifference to revelation and its teaching.

Of course he has a fling at the bitter sectarian feeling among professedly Christian people; there is no danger, we are told, of any man being seduced in these days into making that old statement, "See how these Christians love one another." And if the spirit of persecution and want of charity did not seem to be laid to the charge of Christianity or the New Testament itself, I should have been very willing here to pass it over. But Mr. Mill says:—

"Orthodox Christians, who are tempted to think that those who stoned to death the first martyrs must have been worse men than they themselves are, ought to remember that one of those persecutors was *St. Paul*."

We say it was *Saul*, not *St. Paul*; an unconverted Jew, not a Christian. But if Mr. Mill would scorn to own any difference which conversion made in the character of Saul, common honesty, one would think, ought to put into the account the fact that *St. Paul* never ceased all his life long to bewail the sinfulness of the act which is here so disingenuously set down to his account.

The very *basis* itself, as well as the objects of Christianity, is sublimely ethical. "*Herein is love!* not that we loved God, but that He loved us, and sent His Son to be the propitiation for our sins." "*Greater love* hath no man than this, that a man lay down his life for his friends." *St. Paul*, therefore, was ethically correct when he concluded "*love worketh no ill to his neighbour; therefore love is the fulfilling of the law.*"

And if it be said that virtue should have its reward, but hereby gets it not, it may be replied that the Gospel places that reward where alone it can be expected,—in the world to come. In this world, the Christian does not receive less than other men; but virtue here has never been crowned with complete success. Christ's kingdom is a brotherhood of the purest ethical character, founded in the most disinterested virtue, and holding out to its members a full reward in the world to come. It therefore demands of necessity *faith* in its members. And it is worthy of remark, that when faith has, upon earth, done its work, and when the future arrives, the decision as to character on the part of the Judge, is described in the New Testament as proceeding upon strictly *ethical principles*. He takes the type of perfect humanity, the "*Son of man*," and tests the actions of each according as they have acted up to that type, and towards others as if towards

it. It is "*I* that was an hungered," "*I* that was thirsty," "*Me* that ye visited."

From what has now been said, I trust I may take leave of my subject. The foundation of virtue is placed by Christ where the best ethical philosophers have placed it, and I do not think that any species of virtue can be said to be wanting in the New Testament. Not that it was ever intended to give us a complete system of ethics. But ethical principles are there, held as it were in solution, to be precipitated and gathered up. They are there because sound doctrine can only be taught through the moral nature, and exhibited in the moral life of man. There are to be found in the Christian's standard of doctrine abundant instances of humility, self-denial, gratitude, liberality, justice, mercy, kindness, forgiveness, and *love*, as the foundation, the mainspring of them all. Gratitude used to be said to be wanting; but the truth is, it shines out from every page which teaches man his duty to God, for love to God is the sublimest gratitude.

In conclusion, then, I seem to feel this thought to be uppermost, namely, that truth, under different forms, points to one author, and wears, in different dress, the same eternal character. But we live, some think, in an age of great research and vast trifling, of profound reverence for the truth and a shallow indifference to it—an age when a few are anxiously working for whatever the truth itself may reveal; but when many, as ever was the case, thoughtfully study nothing, and yet, in a sense peculiar to the times, catch up the ephemeral schemes of the hour, laugh at eternal verities, and treat religion and all that is real and spiritual as an effete thing. Against positivism, materialism, and infidelity, ethical science raises its voice. And in its interactions and relations, it points to an universal philosophy, where the spiritual and the material, the moral and the intellectual, without prejudice to each other, shall find a common resting-place.

As to each man thinking out every moral, social, and religious problem for himself, to say nothing of the presumptuous rejection of revelation which it implies, it could only end in a world of sweat and labour for daily bread, by nine hundred and ninety-nine persons out of a thousand, thinking out nothing at all, believing nothing at all, and living, to all practical purposes, the veriest heathens, amid the full light of Truth itself streaming around them.

I am no enemy to freedom of thought and discussion, but I cannot close this paper without observing that while the abstract speculations of men who affect to think out all things

for themselves—who spurn the very idea of “authority,” and who ridicule the word “obedience,” have left the world one after another, unbenefitted and unblest by any appreciable moral good. He who did claim to speak with “authority,” who did enforce the duty of “obedience,” in all things lawful and honest, went straight home to the hearts of men with His teaching, touched there a responsive chord, and left His mark so deeply impressed upon the race, that after eighteen centuries have passed away, there are still found to be something like 350 millions of living disciples ready to add their testimony to that of old, that “never man spake like that man.”

The CHAIRMAN.—It is now our duty to return thanks to the author of this paper. Our thanks are especially due to him for introducing us to another field on which to meet our enemies. I am sure we are all very much indebted to him for bringing forward this subject.

Rev. C. A. Row.—The subject which has been introduced to us to-night by Mr. English is one in which I feel a particular interest, and to which I have given as much thought as to any subject whatever. There are many points in Mr. English's paper which are worthy of our deepest attention, although I do not think the paper, as a whole, has taken quite so wide a view of the subject as it might have done. But I will confine what observations I have to offer to that portion of it which deals with moral philosophy, and in such criticism as I shall be able to enter upon I hope the author will feel that I am only actuated by a desire to lead to an enlarged view of the subject. The author says :—“In that great principle of action, faith, we see an extension to what is spiritual of that confidence which, by nature, man was formed to repose in his fellow-man.” Now I do not think that this is a sufficiently comprehensive view of the nature of faith, but as that question will form a portion of a paper which is now in the hands of the Council and which I shall read to the Institute shortly, I will not discuss it at present, although I should have liked to have offered a few observations upon it. Further on Mr. English says :—“Ethical or moral philosophy is the science of right and duty—the ‘habit of virtue’ according to Aristotle : ‘the art or science of living well’ according to Cicero.” But I doubt whether you can find in the ethics of the ancients the Christian idea of duty at all. In the Greek philosophy, all ethics were a portion of politics, and there is no idea of duty contained in the Greek writers further than that duty which binds men to political society. The highest moral motive of the Greek philosophy is τὸ καλόν, that is, the morally beautiful ; but that must not mislead us into the idea that there is such a thing in the heathen philosophy as the Christian idea of duty. In “the science of the habit of virtue” the writer gives not a bad definition of what Aristotle meant by ethics. No doubt, from his point of view, it was the science of the habit

of virtue ; but it should be observed that Greek philosophy uses the term virtue in a more extended sense than we do. The Greeks, for instance, might have spoken of the virtue of that pen, or of the virtue of that table. In Greek that would be quite correct ; but it is not so with us. I think moral philosophy may be more naturally defined as being the philosophy of the activities of man, and I think the range of moral philosophy is exceedingly extensive. I quite agree with Mr. English in his remarks upon the slight extent to which the study of moral philosophy is pursued at our universities. I think it is a sad thing that it should be so little studied in this country, and I feel great wonder that at the only place where moral philosophy is practically studied—the University of Oxford—it has made so very little progress for many years. I speak of it, remember, in the sense of Christian moral philosophy, because I am afraid that all existing theories of moral philosophy are sadly deficient in embracing the great facts of revealed religion. Now, just let me notice two points of deficiency. The ancient moral philosophy is a portion of politics, and the ancient philosophers could not take any other view of it because they had no data for doing so. So far they were right, but in the Christian religion moral philosophy has attained a very much higher realization, and yet I do not find in any existing treatise any distinct recognition of the Church of Christ as a great phenomenon in moral philosophy. Since the days of Butler, Christian moral philosophy has made no progress whatever. Another point in which Christian moral philosophy is lamentably defective is found in this, that it has taken, and does take, no account of the most powerful of all moral influences, the great Christian principle of faith ; and I use the word faith in a wider and more extended sense than that in which the author of this paper has used it. There is one strong point in every system of moral philosophy, and that is the immense power of habit upon human nature. But to effect changes through the principle of habit is a very slow process ; and if our only hope of making the world better depends on acting on the state of moral corruption by habit, we shall find ourselves in a very bad state. In his 10th book Aristotle tells us, with a certain degree of pathos, what he thought would be the result of his treatise, and his only hope was to act upon a few select spirits :—the human race, the great mass of mankind, he felt himself utterly powerless to deal with. That is the simple result of the mere principle of habit, as Aristotle contemplated it. Now, our Lord, in building up His Church, certainly did intend to act on human nature by the principle of faith. I apprehend that He looked upon the great principle of faith as being that by means of which man can be made better ; and He proceeded in His work, beginning with the intellect, through the principles of faith, and getting down into the heart. But that principle is altogether ignored by every system of moral philosophy with which I am acquainted. Nothing would be more valuable, and nothing would more effectually dissipate scepticism than honestly investigating many subjects where Christianity has stirred the profound depths of humanity, and seeing how far it is adapted to the moral nature of man. A few months

ago, while in the British Museum, I looked over all the recent editions of Aristotle, to see whether anything had been added in recent years. I examined them with considerable attention, but I failed to find in any of the commentators of the last twenty years any ideas drawn from Christianity. I looked at Grant, but I did not find any enlarged views connecting religion with moral philosophy; and I found that, practically, since the days of Butler, we had made no progress in harmonizing the revelation of God with the moral nature of man. I feel that the whole Christian Church suffers an enormous loss from this, and Mr. Mill would not have said such foolish things as he has done if it had been otherwise. I very cordially agree, therefore, with that paragraph of Mr. English's paper, which deals with the slight extent which moral philosophy is taught in this country. In another passage Mr. English speaks of Aristotle's division of the mind of man, and here I think is the weakest point of Aristotle's mode of procedure in founding any portion of his moral philosophy on arbitrary divisions of that description. Moral philosophy, if good for anything, must be founded on the facts of human nature, including those acted upon by revelation. As far as human nature is acted upon by revelation, the investigation of it comes under the principles of moral philosophy. But I very much doubt whether that portion of Aristotle is not the weakest of his whole system. Mr. English, in another passage, says:—"The springs of action excited, it is the office of the higher powers to regulate human conduct, reason giving to man a sense of prudence, enabling him, that is, to select right means, and conscience giving to him a sense of duty, or aiding him in the selection of right ends." I presume that in that passage the author means by "prudence," the *φρόνησις* of Aristotle. Now I have given long and deep attention to this subject, and I believe that the 6th book of Aristotle's *Ethics* is exceedingly defective in its analysis of the intellect of man, in relation to his moral character. I believe that Mr. English has adopted throughout the views of "the *Ethics*" upon this point, which very much narrows the action of man's reason upon his moral nature. In one word, the author in his subsequent pages implies that the intellect always follows, and does not precede moral action. Now I entirely dispute the truth of that. I mean to say that in every act of faith the intellect goes first. I use the word in a wide sense, and include the whole of our rational powers. It is difficult to speak accurately when using the terms "intellect" and "reason"; but I hold that the author has taken much too narrow a view of the action of the intellect upon the moral nature of man. Mr. English goes on to say:—"Ideas of right and wrong are simple and intuitive. They provide materials for the exercise of reason; but it seems to me that without an intuitive moral faculty we could never have such ideas at all." But I apprehend that reason is directly and closely connected with almost every one of our moral actions in a much wider sense than is admitted here. With very much of what the author says under the head of "the efficient cause of human action" I cordially agree, for it virtually embodies

some of the principles which I had the honour to lay before the Institute in a paper earlier in the year; and as it states my own view, I will not take up your time at any length upon the question as to whether man does actually possess a free will. In my own paper I used the term "rational will," and I was not wholly understood; but when I unfold my theory of the moral nature of man it will be seen what I did mean. There are those who deny the freedom of the will, and among them are the Positivist philosophers; but it does appear to me most wonderful that they should hold to that view in the face of the examples that can be brought against them, and especially in the face of one or two examples from ancient history. What could be more grand and more noble than the sacrifice of the four hundred Spartans at Thermopylæ: the inscription "Go, stranger, and tell the Lacedæmonians that we lie here obeying their laws," records the pure idea of voluntary self-sacrifice. So, again, take the Christian martyr. I want to know whether his sacrifice—that rational sacrifice in which all his rational powers concurred—was not the exercise of free-will. It is by means of the concurrence of our rational powers in the act that self-sacrifice takes place. The Duke of Argyll has fallen into the same error. Although I have the greatest respect for his Grace, still, when he takes up the subject of freedom, he takes the lowest forms of human or even of animal action to reason from, and that is out of place. Why should they not take the higher acts of the human understanding or intellect to illustrate their theory? To sink down to some poor miserable wretched cat, (though I do not mean to deny that a cat has freedom of will to a certain extent,) appears to me to be going uncommonly wide of the mark. Mr. English states:—"Mr. John Stuart Mill has said it has never been possible to extract a body of ethical doctrine from the New Testament." I agree with the author in joining issue upon that assertion. It is utterly absurd, and it is plain that Mr. Mill can have given no sustained thought to it. I admit that the four Gospels contain no perfect rules of ethics, and blessed be Heaven that they do not; but I hold that they contain all the great principles which are the foundation of ethics—that they do bear out the principles of moral philosophy, and that the principles of moral philosophy do bear out the Gospels. Mr. English says further on:—"The Founder of Christianity sought to stir up morality by an appeal to the springs of moral action, love for mankind (*ἀγάπη* = *φιλανθρωπία* = *humanitas*) being the foundation of virtue which He laid down." But I go further and say that the basis of moral action is faith. In the character of God, and in the revelation of our Lord Jesus Christ, there is laid the basis of moral action. What in fact produces the feeling of benevolence in my mind? Some thought suitable to awaken that feeling. Mr. English further says:—"The powers of reason are treated by the Founder of Christianity as regulative merely, and the mere intellectualist, such as Mr. Mill, misses the root of the matter when he seeks to build up an ethical system upon merely rationalistic grounds." But I do not think that the Founder of Christianity has treated the principles of the intellect as merely regulative. I am satisfied that our

Lord did contemplate that the action of man's reason should be brought to bear upon his moral nature, and by introducing something good and holy and pure into that reason by means of faith, He revolutionized that moral nature. But here is a passage in the paper which I wish to have explained :—"Now of all the systems of virtue, the theories propounded respecting it, there is not one that can be said to rival the teaching of Christ. But there is one which comes very near to it,—I mean the eclectic system of Platonists, which, after the age of Augustus, made virtue consist in benevolence." He then goes on to quote from Adam Smith, who in turn quotes from some disciple of Plato, but without naming him. I meant to have looked this up in the British Museum, but I have not been able to do so, and I want to ask Mr. English whether he has ascertained that the passage referred to is actually to be found in a Platonic writer. For my own part I do not believe it is to be so found, and if it is found, I wish to know what is the date of the writer in whose works it appears. It makes a considerable difference if it is found in a Platonist of the reign of Augustus, or after the time of Christ. You often find in Seneca and in Marcus Antoninus, and other writers of the Stoic school, the very highest principles; and though I do not believe the story that Seneca had communication with St. Paul—still there is no doubt that within thirty years of the crucifixion there was a very considerable infusion of Christianity in the heathen world. It becomes, then, a matter of importance to ascertain the precise date of any particular writer, and I should like to know if Mr. English has endeavoured to verify the statement made by Adam Smith, and if so, whether the writer he refers to flourished before or after the birth of our Lord. I feel uncommonly sceptical as to whether Adam Smith had found the words he quotes in any Platonist; but if they are found anywhere, it will be, I fancy, in some of the schools which existed in Alexandria. It is all nonsense to tell us that if any late school has elaborated some high form of thought, it therefore existed independent of Christianity. Further on Mr. English says :—"I will not refer to the main principles or theories of virtue held by Plato, Aristotle, Zeno, and Epicurus. I choose rather to take up details, and show that what was good in the systems of Plato and Epicurus, the most opposed of the ancients, is to be found in the New Testament." The author then goes on to discuss that point; but I think he has hardly been sufficiently cautious in dealing with it. I quite agree with him that whatever is good in the heathen morality you may find in the New Testament; but I maintain that it does not exist in the New Testament in the form in which it exists in heathen morality, but is based on essentially different principles. I am prepared to admit that the New Testament does appeal to several of what we call the lower principles of human nature—self-love, for instance; but while I admit that, I wish to draw attention to this fact, that Christianity, as a system, does not rest on those lower principles, but on very much higher ones, and though self-love is a principle appealed to in the New Testament by our Lord himself, yet there is one thing which has struck me, on a careful study of the subject, and that is, that while the Evangelists

do exhibit in our Lord's teaching an appeal to self-love, yet they have never once depicted Him as animated by that principle. Now that is a remarkable fact, and I think Mr. English has not been sufficiently cautious in regard to it. Unless one was careful, this assertion might lead to some misapprehension, and to the thought that the morality of the Gospel rests on the lower principles which Mr. English has enumerated. And I think he is not quite happy always in his application; for instance, where he speaks of prudence and temperance. I do not think that he has exactly put the matter there as it should be put. But I will not take up any more of your time by any further criticism.

MR. POYER.—My first word must be a word of protest against an opinion enunciated by Mr. Row, that Christianity is to be taken as recognizing the principle of self-love. I have always apprehended Christianity to be destructive of self-love. The principle that involves universal love, the principle that involves self-sacrifice, is antagonistic to self-love.

[Mr. Poyer then asked permission to read some written observations; to which exception was taken; and, as they related chiefly to Positivism, it was suggested that they might perhaps be fitly incorporated in a paper on that subject, which he proposed to read before the Institute. The discussion afterwards proceeded as follows] :—

REV. DR. IRONS.—The absence of Mr. English makes it extremely painful to discuss what he has said. It is not right that we should always, and as a matter of course, pay compliments to our essayists; but, though I shall speak plainly, I am sure Mr. English will be able to bear it, and to treat what is said with philosophical equanimity. The whole subject dealt with by Mr. English is, I fully grant, of so much importance that we are obliged to him for having brought it forward, but for the method in which he has brought it forward I am not quite so grateful, as there is a great want of method and arrangement in the whole paper. I agree, however, with Mr. Row, that as to the main points put forward all sound-thinking Christians will agree with Mr. English; and the criticism made by Mr. Row upon the paper I think, will prove one of the most important that has yet proceeded from this Society, and I say that without at all undervaluing some very valuable discussions which are recorded in our Journal. I fully agree with what Mr. Row said concerning the ethics of Aristotle. No doubt Aristotle was unable to grasp the Christian idea of duty—of ultimate moral responsibility. It had never been suggested to him practically. He analyzed human action in a scientific way, and he really may be said to have had rather a science of ethics than a philosophy of ethics; for philosophy and science are not the same thing. You will, I trust, perceive what I mean by this. If I were to say, "There is a science of anatomy," it would not be the same thing as if I were to say, "There is a philosophy of anatomy." A philosophy of anatomy would at once lead your thoughts to a comparative estimate of various anatomical systems, but a science of anatomy would be quite another thing. Philosophy deals with the mutual relation of one subject to another, but science deals with the exact knowledge of one particular subject; and I am sorry to say

that ethical philosophy and ethical science seem generally to be supposed to be the same thing. The words are used clumsily. Now I suspect that Aristotle had no moral philosophy at all—he said merely, “I will write of the ethics of that state of things in which we exist”—and he had a very accurate ethical science. That will explain the difficulty which lies in the sixth book of *Ethics*. The intellectual virtues there are misplaced; their relation to pure ethics seems to have been misapprehended by Aristotle, as Mr. Row has pointed out. Virtue, according to Aristotle, is a mean between two extremes. He defines Happiness in connection with it,—*ψυχῆς ἐνέργεια τις κατ’ ἀρετὴν ἀρίστην ἐν βίῳ τελείῳ*—that is to say, an energy of the soul according to perfect virtue in a perfect life. That leads him necessarily to a discussion of what perfect virtue is, and that could not be carried out without an analysis of the intellectual as well as of the moral virtues. Thus the whole is made to lead up to that perfect life we believe to be developed in Christianity. Christianity adopts the same definition of happiness; but we must bear in mind that we have a perfect life set before us, and a polity of an exact kind in our Revelation, of which Aristotle was wholly ignorant. And I agree with Mr. Row in his view that nothing will impress our religion properly upon the conscience of the world but pointing out in this nineteenth century that ethics and Christianity are really inseparable, and are both parts of the same system of our Christian polity. Another defect which I have to point out in the paper of Mr. English is that he has fallen into the usual error of almost all moral and metaphysical writers, in making minute subdivisions and classifications of human faculties and powers, using words in peculiar senses of his own, and endeavouring to impose those senses upon other people. When men will begin moral and metaphysical science with arbitrary definitions, they will never convince the world of their conclusions. They must really use language in its ordinary common-sense meaning, and endeavour to show people the truth without teaching them a nomenclature to begin with. But there is one point on which I must express a very different opinion from the author, and that is concerning the freedom of the will. I am quite sure that this is the one point on which Christianity will, in our day, have to fight its battle. The whole tendency of the day is to turn men’s minds from the will to a kind of inert action, which they call force. I say “inert action,” for I really think that nothing short of that contradictory term will express my meaning. They deny that which is the real cause of all action, and yet seeing constant motion and action in the universe, they attribute it to an abstract idea. We shall have to fight the battle of Christianity on that question of the will of man. But though I must not be understood as even here acquiescing in the *obiter dicta* of Mr. English, yet I must thank him very heartily for the fearless way in which he has combated the infidelity of Mr. Mill and others. I think too he is quite right in confronting the *dicta* of Mr. Mill with those of the author of *Ecce Homo* in one point. It required no little assurance on the part of a public man in England in this nineteenth century to speak of Christianity as Mr. Mill has spoken of it; and I am not myself surprised

that, after having so expressed himself in his *Essay on Liberty*, he has gone further, and, according to the newspapers, has refused to say he acknowledges the being of a God. The two things go together ; the latter explains the former. Previously, when we found fault with the sneers at our religion contained in Mr. Mill's books, we were told, in a triumphant way, that we could not lay our finger upon any passage of direct denial of fundamental truth ; and there was a sort of popular truth in that, because he had veiled his intentions, and average readers would very frequently fail to perceive his drift. But Mr. English has, in this paper, brought out into strong relief some of his most mischievous sentiments, and now it is for Mr. Mill and his friends, when they see the prominence here given to these things, to make the best of them, and to meet us if they will in this place. There will be many opportunities in addition to this of discussing the ethics of Positivism. But before I sit down let me allude to a point raised by Mr. Row as to the passage from Adam Smith ; and observe that not until the time of Porphyry and Iamblichus, both Neo-Platonists and born in the third century of the Christian era, have we anything in the heathen writers of Alexandria that corresponds to that passage.

MR. REDDIE.—Allow me to observe on that point that Cudworth and Hutcheson are also referred to in the paper quoted from Adam Smith as belonging to that school of Neo-Platonists ; but no one would dispute that Cudworth's writings are especially imbued with Christianity ; and Hutcheson, in the introduction to his *Moral Philosophy*, addressed to the students of the universities, while he recommends them to go to elementary books, in order to obtain all the instruction they can from the Greek and Roman writers, goes on further to say :—"Have recourse also to the yet purer fountain of the Holy Scripture, which alone gives sinful mortals hopes of a happy immortality" ; and throughout his lectures he always leaves the question of human virtue open to supernatural influences on man by the Spirit of God. And so I believe that all those writers to whom Adam Smith has referred were essentially Christian, and unquestionably those named were not *pre-Christian* writers. I make these remarks now, but as the subject is a very large one, and as so many points in Mr. English's suggestive essay are yet entirely unnoticed, I beg leave to move the adjournment of the discussion to our next meeting.

The Rev. W. Mitchell seconded this proposal, which was agreed to ; and the Meeting then adjourned.

ORDINARY MEETING, DECEMBER 21, 1868.

THE EARL OF SHAFTESBURY, K.G., PRESIDENT, IN THE CHAIR.

THE minutes of the last Meeting were read and confirmed.

The discussion on the Rev. W. W. English's paper on "Ethical Philosophy," &c., was resumed as follows :—

Rev. Dr. IRONS.—I am not aware whether Mr. English is present to-night ?—

Mr. REDDIE.—No, he is not.

Rev. Dr. IRONS.—I am sorry for that, because that made me abstain to some extent at our last meeting from expressing the severe disappointment which I felt on reading Mr. English's paper. I thought that when we are occupying, and hoping to occupy permanently, a position before the world which should be defensive, a position that should be a credit to our Christianity, it was a pity that we should put forward anything on an ethical subject that would not bear scientific and careful examination. I do not think the paper before us, regarded as a whole, is exactly that which this Institute ought to throw down as a challenge to the scientific world—

Mr. REDDIE.—I really must beg here to observe that authors are alone responsible for their papers. If we were only to bring forward those papers which the Institute could adopt, it would close discussion altogether. I think those observations which have just been made by Dr. Irons have more the nature of reflections on the Council, for passing the paper of Mr. English, than on the author. You cannot make a man think in your own way. We have had a former and very valuable paper from Mr. English on another subject ; and though I admit that the paper now before us is discursive, still it is the first paper we have had upon ethics, and the author could only be expected to deal with it in his own way.

Rev. Dr. IRONS.—I am only saying why I think the paper is defective. Its discursive character is such, that we could not put it before the world with much credit to ourselves. I do not say this as blaming the Institute, but because we are bound to remember the very great sacredness of our cause and to put before this gainsaying and truth-denying generation nothing that will not bear very close examination. I am only to discuss the paper before us, and not by any means the acts of the Council, who have no doubt done their best. On this occasion we have to deal with ethical

science in its relation to other sciences and to Christianity ; and I would say that ethical science ought, in an association like ours, to be regarded *per se* and previous altogether to the conception of revelation. If man is a responsible being at all, he is so before revelation comes to him. Man as man, is accountable for his actions everywhere, and if he were not accountable beforehand, revelation by coming to him could not make him an accountable being. But the two things are mixed up together in a strange way in this paper. Ideas which are purely Christian ideas, are mixed with those which are purely philosophical and ethical, so that you cannot tell where the ethics end and where the revealed system really begins. Now man, if we are to regard him as a being responsible to God and to his fellow-creatures, must be first of all contemplated as responsible to his fellow-men. In the first instance he finds himself in society held accountable undoubtedly by his fellow-men for what he does, and the idea of God, though implanted in him, is elicited from his nature subsequently. That prior notion of accountability belongs to him as a conscious being from the very moment he begins to act among his fellows. The religious idea of accountability is a subsequent idea. Various additional helps are given ; many new truths are implanted by revelation ; but those helps and those truths are wholly subsequent, *in modo concipiendi* as well as in fact, to those prior notions of accountability. There should then have been a careful line drawn between ethics and revealed religion. The notion of grace, for example—and I only give it as an example—the notion of grace is assumed in one part of the paper. We as Christians thank our God that He does impart His grace to strengthen our defective moral agency, but we have no business as philosophers to assume the idea of grace until we have cleared the ground beforehand and shown the nature of the previous accountability—the nature of the defect—the need of the supply. Then I find the same unhappy deficiency in the paper in treating the question of free will—the mingling, that is, of the two sets of ideas, the ethical and the revealed ; the ethical and the purely Christian or religious. If you will turn to the chapter on “the efficient cause of human action” you will find it quite impossible to ascertain what the philosophy of the writer is. He assumes in every point. He says :—“The appetites, desires, affections, &c., forming that part of human nature called the sensitivity, were designed to be under the direction and control of reason and conscience.” I suppose there are at least half a dozen enormous assumptions in that sentence—assumptions which imply both religion and moral philosophy, but in the most indistinct way. The sentence puzzles me. Then he goes on :—“Yet these springs and guides are also dependent upon the *will*, as the last link in the chain of intention and the first of action. But what is volition ? how comes it to pass ? Do the sensitivity and intellect invariably guide and *necessitate* the will ?” I seem to be reading words without any clear and logical meaning at all. I am not at all aware that there is a part of human nature called the sensitivity ; it is a term that I am not familiar with—it requires explanation. Nor am I at all aware that the sensitivity and intellect invariably guide and necessitate

his present one. One feature in Mr. English's paper is that it contains so much controvertible matter ; and I hope Dr. Irons and others will take up various of its points in subsequent essays. In a general paper of this kind, where the author is acting on the defensive against the attacks of others—and this Institute, as Dr. Irons has pointed out, is really a defensive Society,—the writer is not exactly able to take his own line always. It is not like writing an abstract paper on moral responsibility, such as we shall have from Dr. Irons shortly, and in which the subject is treated *per se*, partaking more of the nature of a formal abstract treatise. On the contrary, this paper is written, one may almost say, in reply to various public writers who have treated of the subjects quite as discursively as Mr. English has done. I must say so much in defence of the paper, which I think it would not have been at all right in us to have rejected ; indeed, for my own part, I should have been content to have taken the essay blindfold from Mr. English, because of the great value of his former paper on miracles, although I was his principal critic and opponent upon that occasion.—Now I come to the paper itself ; and here I am going to speak quite freely, as I am sure Mr. English will expect. He will have the right of sending us a written reply, as he is non-resident. He would have been present to-night if he could have come, but he was unable, from other engagements, to be with us. However, he sent us a very valuable written reply on a former occasion, and I have no doubt he will do so now. In dealing with the paper, I am led first to the remarks which are made on Professor Tyndall ; and here I think Mr. English, in his zeal for the very cause which Dr. Irons has advocated, has somewhat misapprehended Professor Tyndall's meaning. He seems to consider that Professor Tyndall has said, that the connection between soul and body is not necessary. Now, I am quite sure Professor Tyndall does not think that, and, indeed, that is not what he has said. What Professor Tyndall says is :—"Associated with this wonderful mechanism of the animal body, we have phenomena no less certain than those of physics ; between which and this mechanism we discover no necessary connection. A man, for example, can say, *I feel, I think, I love.*" Professor Tyndall is not, then, speaking of the connection between soul and body, but of the connection between certain *actions of the mind* or soul and the body, such as are expressed by the words, "*I feel,*" "*I think.*" Then Professor Tyndall goes on to ask, "But how does consciousness infuse itself into the problem ?" and Mr. English admits, in the words of the Professor, "that the 'problem of the connection of body and soul is as insoluble in its modern phase as it was in the pre-historic ages.'" By "insoluble," I suppose, is meant "insolvable,"—as a problem is not like sugar or salt—it cannot be melted, it must be solved. Professor Tyndall may know a great deal about the opinions which were entertained in the pre-historic ages, though I am not aware that there is any record of them (laughter) ; but, at all events, Mr. English does not make that a point of dispute. But Mr. English asks, "Why is the connection between body and soul severed by pain in so short a time, if that connection is not necessary in the eyes of science ?" and I only refer to this to show

how loose the argument is. Either Professor Tyndall does not maintain what Mr. English says he does, or Mr. English himself believes what he seems to argue against. My own opinion is, that Mr. English does believe that the body and soul may be separated without the destruction of the soul, and I am not sure that Professor Tyndall does hold that view!—Then Mr. English says :—“What is ethical cannot be separated from what is physical and theological, very frequently.” Well, “*very frequently*” we do know that that may be so, but until you come to those words, he seems to be putting an invariable and absolute proposition before us. Then he says :—“Mind is connected with matter, and both have to do with morals.” But mind is not connected with matter abstractedly, and there is no necessary connection between them always. And “both have to do with morals.” Now that I deny. I deny that matter has to do with morals, and such an assertion seems to me almost as if we were drifting into Manichæism. All that is moral or immoral is connected with mind alone and not with the mere animal body. It is not that which goeth into a man that defileth him, but that which cometh out of him. We have high authority for that. It is the defilement in the mind that constitutes immorality. Then there is another point in the paper which I must notice, because we must bear in mind that this paper is thrown out as a challenge to the men of science. I heard Professor Tyndall make use of similar language to that now animadverted upon, greatly to my delight, in Sion College, on the occasion of Professor Huxley reading his paper there ; and I considered it an acknowledgment that “there are more things in heaven and earth than are dreamed of” in natural-science-philosophy. But what will Professor Tyndall and his friends think when they come to read this ? Mr. English refers to the Positivist notion “that every branch of knowledge leads the inquirer through three stages ; that the mind, on seeing phenomena, first desires to know the causes at work producing such phenomena ; then, leaving causes, it seeks after abstract forces ; and lastly, confines itself to laws,—‘the God of this world, which blinds the minds of them that believe not.’” Now I protest against that. I am sorry to have texts introduced at all into our papers ; but how the natural laws, the laws of God’s nature, should be connected with “the God of this world which blinds the minds of them that believe not” I cannot understand. “The God of this world” alluded to by the Apostle is the spirit of evil ; and the spirit of evil has nothing to do with those natural laws of God’s ordaining. I am surprised that that passage should have escaped Mr. English’s pen. And now let me pass on to another part of the paper, where there is a still more extraordinary error, in allusion to St. Paul’s admonition to the Philippians :—“Whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, whatsoever things are of good report ; if there be any virtue, and if there be any praise, think on these things.” Mr. English, after quoting that text, goes on to say :—“Which St. Paul bade the Philippians ‘think on,’ if there be any such thing as virtue.” But the text means nothing of the kind. St. Paul, after enumerating a great many things, simply

goes on to suggest, "if there be any other virtue or ought else praiseworthy, to think of these things." But in the paper before us, it seems as if there were some question raised as to whether there be any such thing as virtue at all! I certainly think that we should have Scriptural texts more carefully used, if used at all. Then there are some phrases used by Mr. English which have puzzled me not a little. I was not so much puzzled about "sensitivity" as Dr. Irons seemed to have been, because I think I know what is meant by the term, but the phrase "presentative faculties" puzzled me considerably. I am not sure what faculties are to be called presentative, because whenever I think, I have something before my mind, and I apprehend all our faculties come into that category. But no doubt Mr. English will be able to throw some light upon the point in his reply. But I will not proceed any further with this minute criticism. I will only take now one or two of the more important points. And I come first to that passage where Mr. English seems to me to press Professor Tyndall—I have no doubt, without any intention of unfairly pressing him,—and he seems to consider him as saying something bad when he is really saying something good. He quotes this passage from Professor Tyndall:—"The scientific mind can find no repose in the mere registration of sequences in nature. The further question intrudes itself with resistless might—whence comes this sequence? What is it that binds the consequent with its antecedent in nature? The truly scientific intellect never can attain rest until it reaches the forces by which the observed succession was produced." Now, I consider that is a positive acknowledgment on the part of a distinguished scientific philosopher that the sceptical theory of Hume, that all things in nature were merely a series of sequences, is not true. I was glad to welcome that acknowledgment, and I do not know why Mr. English is not satisfied with it. He says:—"I have a fair-haired boy of five whom I feel in danger of regarding as 'truly scientific,' for he bothers my very life out to know the cause of everything." Well, my answer to that is, that the man is the same as the child, only with a larger experience. It is an astonishing thing how early children begin to reason; and I should be sorry to think there is a line drawn between the philosophical mind and the child's mind—in fact, I am inclined to believe that the more philosophical the more childlike. I repeat that I do not understand why Mr. English is not satisfied with this admission of Professor Tyndall's. I was glad to see it, for I thought it was anti-Positivist, and not atheistic at all. Then Mr. English goes on to the question "what is force?" and on the next page, with a mark of admiration, he says:—"Force! why who has ever tried to conceive what this word can mean, further than his own conscious efforts of volition, as by a sort of figure, enable him?" But any one who feels a stone fall upon him has a strong impression of force without any conscious effort of volition. The reflex action is a different and subsequent operation of the mind. Any one who feels the weight of a stone which falls upon him must be impressed with the notion of being weighed down, and although I have no doubt he will believe that the blow must be due to some preceding force that caused it, still that is not the first thing in his mind. I wish Mr.

English had been more careful in the use of these expressions. Then he pulls up Professor Tyndall for substituting the word "doubtful" for "invisible" in some argument which he does not tell us anything more about than that the Professor proceeded "to argue upon the change of terms, as if it were warrantable." Everybody knows that this is unwarrantable in logic; but Mr. English himself is guilty of the very same fault on the next page, in a very important matter, namely, as to whether miracles are to be considered as coming under laws or not. He says:—"Law, in the sense of order, may be said to be common to all branches of philosophy. There is an order of thought as well as an order of material sequence." But there is no connection between the material sequence by which a heavy body falls to the ground and the order of human thought. I only wish we were all as steady in our thinking as a stone is in falling! But Mr. English, by looking at all sorts of things in nature, and seeing that there is an "order" which belongs to them, tries to bring them all into the category of the same order. Then he says:—"Law denotes order, not force, and it is common to all branches of philosophy, metaphysical, moral, and material." But before that, he says he has been asked—(and I remember it was I who asked him the question in my Annual Address two years ago)—"Do you, in fact, use the term law in the same sense as when you speak of physical law?" He says he was asked that question when speaking of miracles, "as coming under a system of moral law." Now I never made any allusion to moral law at all: I was speaking of regular laws, invariable in their action. He says:—"Law denotes order, and not force." But nobody ever said it did mean force. It was, in fact, I who argued that it meant order; and I quoted Bishop Butler in defence of that, to show that the laws of nature had only a meaning by being understood to mean something settled and fixed; that is, "orderly." If any one applied the sense of force to them, it was Mr. English himself, when he spoke of the force of nature intercepting the fall of a stone. He rings the changes upon these words, and in point of fact does just that which he says is wholly unwarrantable in Professor Tyndall! Again he tells us:—"Every one truth is connected with some other truth." Now I am not quite sure of that; I should like to see it proved as well as stated, though no doubt there are many truths that are thus correlated. Further on Mr. English speaks of the atonement as "the highest form of that friendly help and mediation which by nature God has taught us to render to each other." But of course he does not suppose that that is all that is meant by the atonement,—and as that is perhaps the least thing it implies, I think it is rather a pity that he has introduced that sentence. In the same page Mr. English tells us:—"There is a Christian as well as a natural philosophy." We know the *Saturday Review* has recently had an article on Christian Science, sneering at the very notion; and I am glad Mr. English makes a stand for it, and am quite prepared to make allowance for his mode of advocating the thing, so that we get the thing done. He alludes to the main object of this Society as being "the consideration of the mutual bearings of the different branches of science and

philosophy," referring them "as branches to some more comprehensive and fundamental principles based upon faith in one Eternal God;"—and upon that subject we want a whole series of papers. There was a great deal said at our last meeting as to "the habit of virtue," quoted by Mr. English as from Aristotle's *Ethics*. Mr. English says :—"Ethical or moral philosophy is the science of right and duty—the 'habit of virtue,' according to Aristotle." But Aristotle never called it the "habit of virtue," and though Mr. English uses inverted commas, that phrase, I imagine, is not a quotation. He then proceeds to discuss the nature of virtue ; but "the regulative principles of moral action" treated of here are dealt with in a way which I agree with Dr. Irons leads to nothing as regards the subject before us. No doubt there is much of that part of the paper which is incontrovertible, and with which we should agree ; but his is a critical paper, and Mr. English is laying himself and us open to a great deal of counter-criticism, and I think that should be avoided as far as possible. At our last meeting I referred to Dr. Hutcheson's *Moral Philosophy*. In that valuable epitome of lectures there is a definition of the cardinal virtues. Mr. English defines them also, but only one of them accurately, I think, and that is temperance. In prudence he rather describes wisdom. We know there is a connection between wisdom and prudence, but they are not the same thing. Nor do I think he quite gives the New Testament idea of prudence. The New Testament doctrine of prudence is rather found where Christ taught His disciples to be "wise as serpents." So with fortitude. Surely fortitude does not consist alone in "maintaining a spirit of honour and magnanimity ;" or, in the act of Christ, in "going into Judæa again to the post of duty." No doubt, in a certain sense, that must be admitted to be fortitude, but we have surely many other better illustrations ; for instance, St. Paul tells Timothy to "endure hardness," and that is fortitude. Then there is a certain looseness about Mr. English's way of treating the subject of ethics, which is to be regretted. Professor Hutcheson, although he treats the subject very much in the way in which Dr. Irons says it should be treated, by taking ethics apart from revelation, always leads you up on questions of virtue to revelation, and in the preface to his lectures he directs attention to the Holy Scriptures as completing the ethical studies of his students. A very important statement was made by Mr. Row at our last meeting, and confirmed by Dr. Irons, and the subject is also glanced at in the paper before us,—namely, with reference to the utter want of attention given to Christian morals in our universities. Now that should be taken to some extent as an excuse for Mr. John Stuart Mill in coming to the conclusion that no one has been able to deduce a system of morals from the New Testament. Our Christian universities are certainly open to the charge that they have done very little in this direction. I recollect some years ago reading a then recent book—I will not name its author—with the title of *Christian Morals*, and I found it a very weak production indeed ; and, unquestionably, I don't understand why Christian men in our universities, when they have treated of ethics, have not risen beyond the traditions of Plato and Aristotle, and deduced a system of morals from the New Testa-

ment, and raised the whole tone of ethical philosophy by introducing that important doctrine of faith which Mr. Row on more than one occasion has spoken of. It is in this that I think Mr. English's paper is weak, for he seems not to think that the heathen morals and Christian morals must to a great extent necessarily agree. There may be some excuse for Mr. John Stuart Mill holding the opinions he does, owing to the utter neglect on the part of Christian teachers to do justice to the most noble subject that could engage them. But even taking Mr. Mill's language as quoted by Mr. English, I think Mr. English has rather strained the meaning. Mr. Mill says :—"Orthodox Christians who are tempted to think that those who stoned to death the first martyrs must have been worse men than they themselves are, ought to remember that one of those persecutors was St. Paul." "No," says Mr. English, "it was not St. Paul the Christian, it was Saul, an unconverted Jew." But it should be remembered that Mr. Mill is speaking merely of the identity of the man, and not of the name he went by ; and no doubt he was a good Pharisee before his conversion, and that is all Mr. Mill asserts. The censure which Mr. English here throws upon Mr. Mill is in my opinion quite undeserved. There is a great deal of truth in what Mr. Mill says, and we need not be offended with him for saying it. I do not agree with him in many of his principles at all ; but I do not see the use of forcing a man's words rather against what he appears to argue. There is only one other point which I wish to refer to. At our last meeting Mr. Row made some remarks about self-love as a Christian principle ; but I do not think he made them strong enough, though one gentleman made a strong protestation against his views. Now we should be very cautious in dealing with this point ; self-love is one thing, but selfishness is quite another. Self-love is really a foundation principle of Christianity. The very message of the Gospel is, "Save yourselves,"—admitting that that principle is of the first importance. Then we are told, "Love your neighbour *as yourself*,"—showing that you are expected to love yourself first ; and I am very sure of this, that if we only love our neighbours *as ourselves*, we may then properly love ourselves as much as ever we please. (Hear, hear.)

Rev. C. A. Row.—I should not have risen again this evening if it had not been that I wish to correct an inaccuracy into which Mr. English has fallen. He has inaccurately quoted Mr. John Stuart Mill, and it is a thoroughly inaccurate quotation. Mr. English says, "But Mr. Mill advances to a more direct charge :—'I do not scruple to say that the New Testament morality is in many important points incomplete and one-sided, and that unless ideas and feelings not sanctioned by it had contributed to the formation of European life and character, human affairs would have been in a worse state now than they are.'" But Mr. Mill does not say that. What he says is :—"What is called Christian, but should rather be termed theological morality, was not the work of Christ or of the apostles, but is of much later origin, having been gradually built up by the Catholic Church of the first five centuries ; and though not implicitly adopted by moderns and Protestants, has been much less modified by them than might have been expected. For the most part,

indeed, they have contented themselves with cutting off the additions which had been made to it in the Middle Ages, each sect supplying the place by fresh additions adapted to its own character and tendencies. That mankind owe a great debt to that morality and to its early teachers I should be the last person to deny ; but " (and here comes in the passage quoted by Mr. English) " I do not scruple to say of it that it is in many important points incomplete and one-sided, and that unless ideas and feelings not sanctioned by it had contributed to the formation of European life and character, human affairs would have been in a worse condition than they now are." What Mr. Mill says, therefore, is that the moral teaching of the first five centuries of the Christian era was of that character ; but he expressly excludes the moral teaching of our Lord, whereas Mr. English makes him call it the New Testament morality. No doubt if Mr. English had gone a little further into Mr. Mill's book he would have found matter which we should all take serious exception to, as in this passage :—" It can do truth no service to blink a fact known to all who have the most ordinary acquaintance with literary history, that a large portion of the noblest and most valuable moral teaching has been the work not only of men who did not know, but of men who knew and rejected the Christian faith." That is certainly very strong, but it is of no use to misrepresent or misquote Mr. Mill on other points. And now with regard to that quotation from Adam Smith. I have been looking into Adam Smith, and I found, as I expected, that he gives no citation to enable me to refer the passage which Mr. English has taken from him to any author of the Augustan age, or thereabouts. But the preceding paragraph is so exceedingly loose, that much of the language may have been written any time within the first two centuries. It is absurd to suppose that it was written in the Augustan age ; and, as I have already pointed out, a few years with regard to morality sometimes involve the whole issue, whether it comes from a pagan or from a Christian source. We must know distinctly the date of any author before we can bring him into contact with the four gospels, and that is a point of which I am exceedingly jealous. As Mr. Reddie has pointed out, moral philosophy is in a most lamentable condition, and we cannot speak too strongly of this. If I were ten years younger, I would see if I could not do something to improve it. So far as Oxford is concerned, moral philosophy is in my opinion in a declining state, I am sorry to say. In my day much weight was attached to Bishop Butler. I am not prepared to say that he really gives us a full exemplification of Christian philosophy ; but now he is very little studied at Oxford, and in his place Mill and others are brought in to be studied. I am really afraid that moral philosophy at Oxford at this moment has much of the atheistical about it.

Rev. Dr. THORNTON.—All that I should have said on the paper before us has been very accurately and ably said already, and I should not have risen at all, had it not been that the ears of an Oxford man are very sensitive, when he hears his university mentioned ; and as I myself have been concerned there for some time with tuition, I must, after what has been said by Mr. Row, attempt to defend my university a little. The study of moral

philosophy has not been so much neglected there as the older Oxonians present might think. One great reason why a proper system has not been adopted in teaching it is that we have no logic. There is no such thing in existence now in England as a real logic. We have no real science of logic, and the systems of Sanderson and writers of that kind are looked at with contempt or serve as pegs to hang criticisms upon. I know I learnt logic by committing to memory a compendium, and I was told by my tutor that the book was wrong on every point, and we took it part by part. (Laughter.) Now I put it to any sensible gentleman or lady present, whether the proper way to learn a science is to give a man a compendium that is quite wrong, and then to teach him where it is bad. The main reason, therefore, why I think morality has not been accurately and properly studied is the want of a true logic—there is a certain haziness that must first be got rid of. If Mr. Row would elaborate a system for us I have no doubt it would be followed. The reason why the coping-stone has not been placed on our system of ethical philosophy—that coping-stone which would be placed by introducing into morality and adding to it that which we learn from revelation—the reason why that has not been done is to be found in our unhappy theological disputes. There can be no doubt that when Plato was talking about the just man, and said “he will be even cut into splinters,” he was feeling about in the dark for some one about to come; and the same may be said of Aristotle’s *σπουδαίος*, the good man, and *φρόνιμος*, the prudent man. It has been owing to our unhappy theological differences that we have been prevented from finishing ethics by a proper system of Christian morality, based on the teaching of the One truly Just and Good Man. I do not think Mr. English in this paper has clearly pointed out the relations of ethical philosophy to science and revelation. He has not shown how ethical philosophy is connected with revelation: he merely says there ought to be such a connection; and he has not shown its relation to science, because he has not gone on the principle of that saying of Leibnitz, who, to the sentence “*nihil in intellectu quod non prius fuerit in sensu*,” added the remark “*nisi ipse intellectus*” (laughter), thus destroying all the point that appeared to be in the dictum. Now Mr. English should have done something of the same kind in regard to the relation between ethical philosophy and science. He should have pointed out how ethical philosophy is a contradiction to positivism, because it shows that there must be a philosophy which of itself cannot be positive, but always touches on higher truths, which positivism does not approach.

Rev. W. MITCHELL.—I feel that this is a subject which is very much beyond me, but I must say a word as an excuse for my own university. Ethics at one time were very widely studied in the University of Cambridge. I remember after taking my Bachelor’s degree, I had the good fortune to attend Professor Whewell’s lectures on Casuistry, which were nothing more than giving the students a *résumé* of the history of ethical philosophy, commencing with the ancients and coming down to the moderns. But when he came down to modern times, so great was the number of books and so great the

richness of English literature on the subject, that he felt himself bound to confine his criticisms and remarks to the writers of his own university, and I think most Cambridge men were astounded with the number of authors on ethical philosophy, and cases of conscience from the university library and other sources. He came into the room, lecture after lecture, with piles of books, and he gave us an admirable and valuable *résumé* of the opinions of the authors of these books, so that I do not think the study of ethics was altogether neglected—

MR. REDDIE.—He did not tell you that all the books were wrong, did he? (Laughter.)

REV. W. MITCHELL.—No, not all. (Laughter.) I remember the sermons which he preached on the subject when it came to his turn as university preacher, when he expressed a wish, which I have heard echoed here, that, considering the extreme value of the fragment we have of Bishop Butler, some one should add to it that which would complete Bishop Butler's labours as a system of Christian ethics. But looking at this matter from the light of common-sense men, I have to consider what would be the value of an ethical philosophy, supposing we were to have the *desideratum* of a complete course of Christian ethical philosophy. I presume the value sought for in such a complete course would be that it would make men moral. Now I may perhaps express extreme doubts, from what I know of moral philosophy, whether any such philosophical system would have the slightest effect on the masses at large. The ancients discovered that truths set forth under the form of strict logical sequence were too hard and difficult to be digested by the general mass. We had it stated by Mr. Row, at our last meeting, that Aristotle never sought to influence the popular mind, and that he therefore sought only to influence the philosophers—the few thinking minds. And that was not only the case with Aristotle, but with all the older ethical philosophers; and it was eminently the case with such men as Cicero and the Latin philosophers who wrote on the subject. Now what do you find is the great want of the present period when you strive to bring the principles of natural philosophy down to the masses? It is said we require a new system of works to be written entirely on what is now called technical education—that the logic of Euclid, for instance, where we have so good an exposition of the logical method as applied to strict inductive reasoning on the subject of geometry, is found so difficult that it cannot influence the mass of men, who require to be made acquainted with and to use geometrical principles. I believe it would be the same with moral philosophy if we had a complete system, and were to attempt to influence the masses by means of it. But, on the other hand, I maintain that the Bible, as a whole—both the Old and the New Testament—does teach ethics, and I maintain that it has taught ethics, and that it is the only book which has ever influenced the masses and made men moral. I maintain that the Bible does influence mankind, and that it is the only system of ethics which has ever transmuted men from mere savages into Christian men. You can find hundreds of such men who could give you a far more exalted system of ethics, and who have far

juster notions of virtue than ever Plato or Socrates professed. In thinking of a philosophical system of ethics, when we remember that our philosophical systems of teaching are so powerless with regard to the masses, it would be well if we were to confine our attention somewhat to the true philosophical method of teaching ethics which we discover in the Bible itself. If any one doubts whether there is such a thing as a pure system of ethics in the Bible, and the feasibility of teaching it to the masses, we have only to go back for eighteen hundred years and see whether the Christians as a body during that period had not been producing a continual series of men and women who in their lives have set forth the purest examples of morality that the world ever saw. On the other hand, if we consider the men in this country who have striven to make ethical systems which should be independent of New Testament revelation, do we not see that all those men have been signal failures in themselves, and have manifested in themselves the utter powerlessness of any ethical philosophy whatever to make men good and moral? And why is this? Because if we reject revelation we are obliged to reject the great truth which we learn from revelation, and which is confirmed by human nature. When we study ethics as manifested in man's moral nature, we are led to the astounding fact that we have to consider, as it were, a morbid anatomy of ethics. Scripture reveals to us that man has fallen from a higher state—that his moral nature is diseased, and that sin is that disease. It tells us what sin is against God, and what sin is against man; and it unfolds to us, as it were, the whole morbid anatomy of man's moral being. It is in the Bible alone, I contend, that we are taught moral philosophy in the manner best adapted to the hearts and consciences of mankind. Go back to the Old Testament. Did any ancient philosopher or writer on ethics ever bring before men more practically the duty of virtue and chastity than we have it in the history of Joseph? And what moral philosopher ever enunciated the principle that the Bible enunciates there—that grand principle to keep a man from erring, the fact of God's presence? Could Joseph do that sin against his God? Dare he do it? I may here—and that is the reason why I have taken the Old Testament for an illustration—refer incidentally to a work upon a cognate subject, though one would not think so from its title. I have derived considerable benefit from it myself, and so have others to whom I have introduced it. It is a work of extreme value. The book I refer to is Isaac Taylor's essay on Hebrew poetry. The author traces there the effect of the teaching of the Old Testament upon the Christian world who have listened to it for the last eighteen hundred years, and he shows how the reading of the Old Testament has, as it were, saturated men continually hearing it from their very infancy with some of the profoundest and most valuable truths, and has thus done much in making them moral and good. He says we are greatly indebted to that Old Testament reading, and to the psalms which we constantly hear in our churches, until the words become insensibly incorporated with our nature, as it were. We are indebted to that old Hebrew literature for the habitual feeling that we have of the presence of God about us—of God's omniscience and God's omnipotence. I

think that in constructing any ethical system we should have to make that feeling our foundation, and become indebted to the Old Testament for laying down the principles on which alone ethical philosophy can be raised.

Rev. Dr. Rigg.—I am very glad to have found myself able at last to be present at one of these meetings. I have long been a member of this association, but the pressure of business has made it impossible for me to be here before. Perhaps I may be permitted to express some of the feelings which have risen in my mind as I have sat, almost as a stranger, listening here. I confess it was with some feeling of disappointment that I heard the minute criticisms given at an earlier period of the meeting. I was longing that we might get to some principles and points bearing on the great questions before us, to which we might attach importance, and which might be discussed as principles. Still, the nature of the paper before the meeting was, no doubt, in itself the reason and, to a large extent, the justification for that minute criticism; and probably the want in the paper of any clear principles which should suggest the course of argument or discussion was another reason why in the earlier part of the meeting we were not led to look at these great principles and points to which I have referred. I confess I almost felt tempted, as I listened to Mr. Reddie's criticism, to a reaction in favour of Mr. English on one or two points. I confess it does seem to me that Mr. Reddie need not in his criticism have gone so far as to intimate a doubt as to whether each one truth does or does not involve another truth. I apprehend that we cannot even conceive a truth of any sort whatever without reference to other truths upon which it more or less depends, and which must be more or less inseparable from it. And I hope also that I may use the word "insoluble" in reference to a problem, and not be compelled to say "insolvable." With regard to "force" and "will" I think Mr. English is metaphysically right; and when we come to the metaphysical conception of which I apprehend he was speaking, force does inevitably and inseparably connect itself in our own mind or consciousness with something like our own consciousness of power or will. At the same time it is clear from what has been said by Dr. Irons, Mr. Reddie, and Mr. Row, that the paper to which our attention has been directed is characterized by at least the average preponderance of statements not very carefully sifted by the writer before he felt it his duty to give them to the society. As regards the principles which have been brought before us, there are two or three things which I should like to say. Mr. Mitchell has told us that only the Bible could have given us that grand principle of morality which in fact was the light of conscience in Joseph, but I could not help thinking myself—where did Joseph get that light from? At the time when Joseph was put under his temptation, he had no Bible to illuminate him. The very man who himself uttered that beautiful, and touching, and sublime principle, which Joseph enunciated, and which is recorded in the Bible, and which there occurs in its original character as the record of a previous fact—that very man must have derived the principle, not from any Bible, for there was none, but he must have been a moral being, a conscientiously moral being, a

person endowed with high ethical instincts, and intelligence, and conscience, prior to the fact of that revelation which we rejoice in. Now here is a truth perpetually coming out when we study the Scriptures closely, and that is, that we must remember that before the first book of Scripture there was a prior, anterior, primitive revelation without which we should have had no revelation at all. All these things combined have produced a large amount and degree of morality or of moral consciousness, and when we come to the New Testament and to Christian ethics, we come to a sort of concrete body of conceptions and of moral intuitions, which consist in part of that which was common to all the best and most thoughtful of all the moralists, and those most amenable to moral influences in the world, and in part of that which belongs to Christianity, and which being added to and connected with the other, makes the total amount of illumination with which we, as Christians, have to deal. We have been told that one reason why there is no moral philosophy in Oxford is because Oxford has no logic. But that only gives a reason for the fact that is previously stated—it does not at all diminish or mitigate the force of the fact itself, that we are without any complete system of ethics at our universities. But what does this statement concerning the want of a logic imply? It implies that we cannot get ethics in their completeness; that we cannot have them fully articulated, and developed, and made applicable to every case of life and conscience, unless the whole matter be thoroughly worked out by means of an applied logic. That is really the implication which underlies the statement, and it leads us to a conclusion of some importance. I believe it is of the utmost importance, even to the mass of the people, that we should have a complete and perfectly developed system of Christian ethics. We have been told often, and told here again to-night, that the morality of the New Testament is higher, and better, and more perfect than that of the ancient Greek philosophers. Undoubtedly that is true; but yet no one can have seen much of the effects of religion upon untutored minds, without admitting another truth, that where the mind is so untutored, morality itself suffers in the hands of those who are unquestionably true and fervent Christians, for want of a complete intellectual character and development. On the other hand, the effect of Christian morality upon the tutored mind, even when the Christian faith is to a large extent abandoned, is most marked. I have learnt something of this from some families who, for several generations, have not been orthodox. I refer to that body who have chosen to call themselves Unitarian. In the moralities and amenities of social life they are often pre-eminent; in matters of honour and fair dealing between man and man they often put to shame those who have more fervent religion, and, as I think, truer and more orthodox Christian views than themselves. What is the meaning of this? Why, from generation to generation they have represented a highly cultivated strain of Christian ethics. They are derived from good Presbyterian families of the time of the Commonwealth, and from that origin they have derived a good basis and substratum of Christian truth and morals. That has never been

lost ; and there has been, in addition to that, all that could be gained in intellectual character and social refinement, and that has produced, from generation to generation, a higher development of the nicer and more exquisite proprieties of Christian morality and intercourse than is often found in those who have, if I may so say, the truth and the root of the matter. If we had more of that completeness of development of all that is included in Christian ethics, and if that were brought out fully in sermons, made clear and level with the understanding of the people, who wish to know what is right, and to do it ; if we were to explain where and why a thing is wrong, and then were to preach the golden rule, we should have in future a much higher system of morality—of commercial, social, civic, and popular morality, than we have at present. Our children often desire to do what is right, but they do not know what is wrong until we tell them how one thing bears upon another, and their conscience then gets enlightened, and they act properly. On the same principle we should deal with persons who have fewer advantages than many of us in regard to culture ; and I am certain that from a complete system of Christian ethics there would arise an increase of Christian propriety, refinement, and sensibility, such as we have never found hitherto. These are the remarks which I wished chiefly to make, and I hope that when Dr. Irons brings forward the paper of which he has given notice, we may see our way to throwing out some principles on which we may work at the subject, both *en masse* and in detail, and have as the result a really practical contribution to the science of Christian ethics.

Rev. W. MITCHELL.—I so thoroughly agree with Dr. Rigg that I am sure he misunderstood my application of the history of Joseph. When I spoke of the temptation of Joseph I was referring to what I considered a great historical phenomenon, and that is, the power of the teaching of the Holy Scriptures in making men moral men. Of course I agree with Dr. Rigg that it was not from the Scriptures that Joseph had his knowledge ; he had it from association with his forefathers, who were men who knew God in a way that very few of us do. Remember he was only great-grandson of the man who had walked with God as a friend, and therefore I presume to say that Joseph had a knowledge of God's nature and holiness that few of us possess, even with the blessed influences that we have of the Holy Spirit of God. I merely say this in explanation, for I should be sorry to have it supposed that I do not agree with what Dr. Rigg has said. And now let me say one word more. If we had a complete system of ethical philosophy philosophically drawn out, I am extremely doubtful whether people would be more moral than they are now. I believe the most unwholesome reading which any one may have is a guide book on cases of conscience, and I do not think such a book would improve my morality. I cannot help thinking that the great majority of casuists, writing on cases of conscience, only teach men, not the purest morals, but the lowest degree of morality, by showing them how near they may go to sin without actually touching it.

Rev. Dr. IRONS.—As to the want of a logic at Oxford, I must leave Dr. Thornton's statement untouched. But the statement made by Mr. Mitchell is of much more importance, that there really has been no effort made by Christian writers to inform the world as to what is Christian morality. I say that the very careful treatise of Thomas Aquinas ought to save us from the imputation that the world has been careless on this subject. Every one of the Christian virtues has been analyzed with the most minute care by that profound scholar, and although his method is not the modern method, still I say his conclusions are very careful and exact. Another remark has been made by Mr. Mitchell, which almost discourages me in the work I have undertaken. He almost goes the length of saying that anything like a careful and logical consideration of ethics is entirely a mistake, and that instead of making men good and moral, it will make them worse than they were before——

Rev. W. MITCHELL.—I was referring to the casuists.

Rev. Dr. IRONS.—In the paper I am going to read before the Institute I shall try to be careful and practical. I understood Mr. Mitchell to say that careful study in morals is to be deprecated. May I ask him to explain to us what he means by that statement?

Rev. W. MITCHELL.—Dr. Irons has entirely misapprehended the drift of my remarks, which were as to the value of teaching the people in general, reaching the large masses of uninformed people, and influencing vast bodies of men. What I say is, that no system of ethical philosophy, independent of revelation, has produced such marvellous results in the world. I believe it could be done now if it has not been done already, and I believe a great deal has been done in this country by the clergy since the Reformation as well as by the clergy before the Reformation—by such men as Thomas Aquinas—to work out a pure system of ethical philosophy. I believe that if we were to hunt among the books in our libraries we might derive a very good system out of what we already possess. I do not think there is such a dearth of ethical philosophy as seems to be believed, but I believe if all this were done to-morrow it would not influence the masses. It might be of importance to meet the infidel with a system of well-reasoned ethics, and to show that we have in that only evolved the ethical principles of the Bible. I think that might be of importance, but I believe that such a system would not influence the masses——

Rev. Dr. IRONS.—Did any one say that we were to use ethical philosophy as a means of evangelizing the people? All we wish is that the metaphysics of to-day may become the common sense of a century hence.

Rev. W. MITCHELL.—With regard to cases of conscience I was only referring to those writers on ethics who took up that particular branch of casuistry called cases of conscience, and I still hold to my opinion that that is a very painful study indeed for those whose duty requires them to enter upon it, and unwholesome food for the mind. One has to approach it as one would go into a dissecting-room to learn morbid anatomy and the

nature of the diseases which the physician has to cure. The clergyman who is called on to deal with such cases of conscience feels, when he goes to the books, that they are not wholesome for his own soul, and he goes as a surgeon or physician would go into a dissecting-room.

Rev. Dr. RIGG.—If Mr. Mitchell's remarks did not apply to what fell from Dr. Irons, they must apply to what I said, or they are altogether irrelevant. Now I had no idea of sending people to books of casuistry to learn the treatment of extraordinary cases of conscience. The thought never entered my mind. All I intended was this,—let people who preach expound moral philosophy, and those who preach Christian duties expound Christian ethics, so that the clear and true comprehension of all that is included in ethics may eventually come within the scope of the common apprehension.

Mr. REDDIE.—It may be as well for us to remember that books of casuistry generally deal with immoralities, and not with the proper subjects of ethics. Aristotle calls ethics the science of virtue, and it is the virtues and not the vices of man that ethics teach. With regard to popularizing these things, I think Mr. Mitchell is unorthodox to this extent, that St. Paul decidedly speaks "of those who have their senses exercised to discern both good and evil," showing that he considered that virtue was not only a habit, but that it required training, and that the mind ought to be trained to understand these things. We have therefore scriptural warrant for such work.

Rev. Mr. ROW.—This meeting seems likely to break up under some illusion. I do not think casuistry is a portion of ethical philosophy at all ; if it is, it is an exceedingly subordinate one. Ethics deal with the whole system of motivity. Mr. Mitchell seems to think we cannot act upon the masses by ethical philosophy ; but, surely, if our clergy get their minds enlarged to understand the Gospel better, they will be better fitted to teach the people.

Rev. W. MITCHELL.—I have only one more remark to make : the Professor of Moral Philosophy at Cambridge is called the Professor of Casuistry.

Rev. Sir TILSON MARSH.—The principles of ethical philosophy are eternal, and therefore they are anterior to written revelation. They are inherent in the very nature of the Supreme Being. The distinctions between right and wrong are eternal principles ; and when the nature of man was created, there was infused into the inferior nature by the Creative Power those inherent principles. That man has gone wrong has been due to the will. There is in the mind of man a sense of right and wrong ; and the point where the machinery has got out of gear has been in the human will. Men know what is right, but they do not do it : they do not wish to do it, and that is why they do it not. With reference to Oxford, I will make only one remark, drawn from my own experience of many years, in close connection with many very superior Oxford men. The fault in our training there has been, not that we have led men to study closely the Aristotelian philosophy. By no means has that been the fault—it has been part of the

excellence of our training. Our fault has been that we have not superadded to it as we ought, the teaching of Christian morals. Christian morals in written revelation supply a motive power, which is not to be secured anywhere else, that motive power being, no doubt, the principle of faith. I think if we added this to our Aristotelian teaching at Oxford, then the teaching would afford a clear and satisfactory training in morals.

The meeting was then adjourned.

REPLY BY THE REV. W. W. ENGLISH.

I AM favoured with a copy of the speeches delivered during the two nights' discussion on my paper, and requested to return it with a "brief reply as soon as possible." I will therefore take up the speeches in order, and if I omit anything of importance I must plead an imposed "brevity" as my excuse.

THE REV. C. A. ROW.

I must pass over all such unimportant remarks as those on "faith," because I have nowhere in a passing reference to it professed to define its full meaning. It appears to me absurd to criticise such passing observations as if they were intended to set forth a writer's full views. Mr. Row thinks my paper has not taken so "wide a view as it might have done," and says "moral philosophy is exceedingly extensive;" but I have taken a much "wider" view than even Mr. Row, for I have said that in its "relations and interactions" it is *universal*. Mr. Row says:—"The author in his subsequent pages implies that the intellect always follows, and does *not* precede moral action;" the author never wrote a sentence which implied anything so absurd. Is the arrangement of this essay not as follows—"springs"—"regulative principles"—"the efficient cause of action"? What authority can Mr. Row have for taking this moral machinery to pieces, and say that I have placed the action of "intellect" *after* "moral action"? Mr. Row actually confuses my analysis of *conscience* with moral *action*! Moral action comprises the sensitivity which *excites*—the intellect, or reason and conscience, which *guide*—and the will which *perfects* action. Mr. Row and another speaker refer to a quotation from Dr. Adam Smith, and invite me to justify it from history; but the following remarks will correct an apparent oversight and misconception. First, Dr. Adam Smith's words are "*after* the age of Augustus," and not, as Mr. Row says, "*in* the reign of Augustus." Secondly, the passage is not a quotation from any ancient author at all, but Dr. Adam Smith's own description of the views of Platonists in general. If

Mr. Row doubts its accuracy, it is for him to give his reasons. Thirdly, there appears to be some idea that in speaking of "philosophers" of the eclectic school, I must necessarily refer to men not Christians. I certainly protest against any divorce between faith and philosophy, and Dr. Adam Smith particularly refers to the "Fathers" as patrons of this philosophy, among whom was the illustrious Clement of Alexandria. I cannot answer Mr. Row's remark about "self love," because the word has been differently defined by philosophers, and I have not the slightest idea which view of it Mr. Row himself takes. I should have been exceedingly obliged to Mr. Row if he had detected any material misrepresentation of Mr. Mill's words, but with the exception of "Christian morality," which ought to be substituted for "New Testament morality," in one sentence, I fear there is no misrepresentation. Mr. Mill begins with defining "Christian morality," and says if it means "New Testament morality," then he wonders that any one could think of it as a "complete system of morals." Then after saying "to extract a body of ethical doctrine from the New Testament" we must "eke out of the old, &c.," he adds the passage given by Mr. Row, not as *distinguishing* "Christian" from "New Testament" morality, but as *that same* morality, with the individual glosses or additions of theologians. He does not exculpate the "New Testament," but charges it both before and after the passage referred to with defect. I fear, therefore, that my passage must remain as substantially just.

THE REV. DR. IRONS.

Dr. Irons complains of a "great want of method and arrangement" in my paper; but I think that my paper is strictly logical throughout as to "method and arrangement." Preliminary general considerations are taken first, then definitions of moral philosophy proper, then analysis of moral action comprising springs, guides, and efficient causation; and then I have added a section on virtue, the specific object to which moral action, as a subjective characteristic of man, is directed. I do not know what method Dr. Irons would have followed, but if he had departed from this arrangement, he would not have followed any logical order. He complains of my "arbitrary definitions." I reply that all the confusion in the world has arisen from neglect of this principle. Dr. Irons seems to fear my paper will not be "a credit to Christianity," and doubts whether this society should have read it. He says:—"The paper is not that which this Institute ought to throw down as a challenge to the scientific world;" I reply that it was written for a very different purpose, namely, to prove that the really scientific part of the world, and the New Testament, are agreed on the subject of ethics. He says a great deal about "accountability;" I have written on the philosophy of moral action, on virtue, and the relations of what is ethical to science and revelation. I have not discussed "accountability." Dr. Irons speaks of "where ethics end" and "where the revealed system ends," and charges me with "confusion;" but it was a main point

with me to prove that grace plants itself upon the ethical tree and ramifies through its every sprig and bough—see pages 395-7. The confusion I apprehend is in Dr. Irons's own mind—we have no *revelation* of ethics except in the *nature of man*—revelation proper has a very different object, to shew man a system of grace. To talk of a revelation of that which has existed from creation would be absurd—the New Testament is the *true interpreter* of previously existing ethical facts, it is not a *revealer* of ethical truth. Dr. Irons is “not aware that there is a part of human nature called the sensitivity; it is a term he is not familiar with—it requires explanation.” I hope the following explanation will make him familiar with its use and meaning—a late professor of moral philosophy has written:—“*Sensitivity* (τὸ αἰσθητικόν) is now used as a general term to denote the capacity of feeling as distinguished from intellect and will. It includes sensations both external and internal, &c.” These are the words of a well known writer who was for about a quarter of a century professor of moral philosophy in the University of Glasgow, and I had thought that most men who claimed to have any acquaintance with ethical subjects had been familiar with this term. Its Greek equivalent is not strange to either the New Testament or the works of Plato. I quite agree with Dr. Irons that essayists should not be “complimented as a matter of course;” indeed, I like the principle so well that I would even extend it to speakers. I never said will was “invariably guided and necessitated;” but I have tried on several pages to prove that it is *not*.

MR. REDDIE.

Dr. Rigg having answered several points I may pass over them, and correct Mr. Reddie in two places. He says:—“all that is moral or immoral is connected with mind alone, and not with the mere animal body.” What then of the “springs” of action? what of Butler's cases of “usurpation,” of “breaking in upon nature?” and what of St. Paul's “keeping under the body?” That the mind's office is to *regulate* action everybody admits, but the above sentence contradicts all mankind except that part of it which is Mr. Reddie's. Again my words “and lastly confines itself to laws, the God of this world, &c.,” surely ought never to have been misunderstood—they do not refer to any “connection” between “law” and the “evil spirit,” but to that atheistic phase of positivism, or that atheistic phase of thought in positive philosophers which refuses to see anything beyond mere “law.” If Mr. Reddie dislikes to have texts quoted he should set a better example, for of all speakers he is the most frequent offender. He says I am a “free lance;” he will not, therefore, object to hear from me in my own character. The passage in Philippians was not quoted as if there were “any question raised as to whether there be any such thing as virtue,” but as setting forth in Scripture language the objective part of virtue itself, as truth, honesty, purity, &c. The “presentative faculties” are such as bring before the mind

matter upon which to think. I referred to Dr. Tyndall's words, and my little boys' thirst for knowledge, simply to shew the absurdity of such bombastic phrases cropping up at every turn as "the truly scientific intellect." The falling of a stone upon a man's body imparts the feeling of pain rather than any philosophic idea of force—Mr. Reddie confuses here effect with cause. I never tried to bring "all things into the category of the same order." Each system of law has necessarily an order of its own. I have not attempted any strict logical definition of the cardinal virtues—I have simply tried to illustrate them. I am sure better Scripture illustrations might be found.

THE REV. DR. THORNTON.

Dr. Thornton will find that I have tried to show that moral philosophy is "universal" in its "interactions and relations," and that every separate doctrine of Christianity, as regeneration, atonement, conversion, faith, &c., is made to work upon ethical principles. How could I point out fully in a few pages the "relations" to science and revelation? I have simply suggested the train of thought that might be worked out.

THE REV. DR. RIGG.

Dr. Rigg's "longing for principles and points bearing upon the great questions before us" is exactly what I have longed for in vain. The speeches have all been confined to small chips from the block—not one speaker has taken the subject in his hand and criticised it. And I think Dr. Rigg himself will give me more credit for "careful sifting" after reading my reply than the speeches of "Mr. Row, Dr. Irons, Mr. Reddie, &c.," for the moment led him to do. There is nothing calling for any special remark in the remaining speeches, and as I am enjoined to be "brief," I will stop here by thanking the members of the Institute for the attention given to my paper, and hoping that the subject may receive further attention from other pens.

I may add that I am happy to know that a favourable opinion of my paper has been expressed by the Press. A very extensively read weekly organ recommended it as an *antidote* "against modern objections to Divine revelation," and says that the arguments used to "prove that the principles of the New Testament are in strict accordance with true philosophy" are "altogether unanswerable."

ORDINARY MEETING, JANUARY 4, 1869.

THE REV. WALTER MITCHELL, M.A., VICE-PRESIDENT, IN
THE CHAIR.

The Minutes of the last Meeting were read and confirmed.

In the absence of the Author, the Secretary read the following paper :—

SOME USES OF SACRED PRIMEVAL HISTORY. By
DOMINICK McCausland, Esq., Q.C., LL.D., *Mem.*
Vict. Inst.

WHATEVER may be the avowed objects and rules of the Victoria Institute, its aim and end must be to harmonize the facts of science with the word of God, as contained in the Holy Scriptures. It was brought into existence by the charge that there were discrepancies and inconsistencies between the facts of science and the language of the Bible; and until that charge is refuted its work can never be completed. The progress that has been made towards that end is, therefore, worthy of consideration, and will enable us to determine the position the question holds in the great march of increasing knowledge.

The rapid advances of science have, within a comparatively short period of time, improved our knowledge of the primeval history of our race that is contained in the early chapters of Genesis. Few are now found to maintain that the earth and all its animal and vegetable organisms were created in six natural days. Few will deny that the Noachian deluge was partial in its extent and destructive effects. And the science of language has furnished the student of Scripture with intelligible and definite notions of the archaic record of the dispersion and confusion of language at Shinar, and of the extent of their operation in the history of the civilized world. So far an advance has been made, in the face of deeply-rooted prejudices and preconceptions, towards a reconciliation of Scripture with facts established by scientific researches. The

true meaning of the Semitic text has been developed by the inductions of the philosophers ; and we shall presently find that some truths, which are mere speculations so far as philosophy is concerned, may be rendered certain when Scripture is called in aid as an interpreter.

To any person who has given attention to the subject, and taken note of the progress of opinion, it must be obvious that there has always been a disinclination, even among the best informed and most religiously inclined members of the community, to engage in the actual work of bringing Scripture and science into harmony. Timid counsels have prevailed in high places, and earnest inquiry has been discountenanced. At one time, it has been urged that the facts of science are not sufficiently ascertained ; and at another time, that the language of Scripture is not sufficiently certain. The question is always adjourned to a more convenient season, which never arrives ; and in the mean time, not only have great opportunities of putting the relations of Scripture and science on a solid foundation been lost, but the position has been prejudiced by presenting a weak front to the enemy. For instance, when Mr. Goodwin's article on the Mosaic Cosmogony appeared in *Essays and Reviews*, the equally mischievous article of Mr. Rorison was put forward by the clergy of the Church of England as the best answer that could be given to it ; and in the "*Aids to Faith*" the cosmogony of Dr. McCaul did not add much to his reputation as an astronomer or geologist, or advance the claims of the Mosaic record to be a divine inspiration.

Some there are who understand and value science, and disregard and ignore revelation ; and some who value the Scriptures and disregard science. Both these classes—and they are numerous and influential—are equally hostile to, and deprecate, any attempt to reconcile Scripture and science ; the former because they despise Scripture and repudiate its authority ; the latter because they cannot, or will not, distinguish between what is true and what is false in science. But there is a third class, composed of those who regard Scripture as the exposition of divine and infallible truth, and who, at the same time, respect science as the true interpreter of the phenomena of nature. Such men are honestly seeking for the harmony that must necessarily exist between the well-ascertained facts of science and the rightly understood words of revelation, and are not to be silenced. Their demand is fair, and must be satisfied. It will not do to tell them, in the exploded language of a bygone generation, that scientific inquiries are not only an unprofitable pursuit, but absolutely

noxious to the believer in the inspiration of Holy Writ. Nor will it do to tell them, as some of a more recent school are inclined to teach, that philosophers, in their pursuit of knowledge, have so frequently erred and retraced their steps—have so often propounded hasty and fallacious theories, to explain the phenomena of the material world—that little or no reliance is to be placed on any scientific dogmas; and that, therefore, it is premature to entertain the question of the reconciliation of the fallible and the infallible. Their common sense rejects such lessons, for they know that scientific truth is attainable, though it is seldom attained without repeated failures; and that there are truths established by philosophy, whose foundations are sure and cannot be shaken, which must be brought into conformity to, and harmonize with, the divine truths which are revealed in the Word of God. The tone of disparagement respecting scientific research and inferences in which so many well-meaning men indulge, is hostile to the advance of true knowledge, and leaves a painful impression on the minds of many that the labours of the philosopher have been vain, or that they are prejudicial to the cause of revealed religion.

In dealing with this subject, the important consideration is, not what theories have been displaced or modified, but what are the facts which scientific inquiries have established beyond dispute; for with them the Scriptures of truth must harmonize. The contest between secular and revealed truths is as old as the revival of science in the seventeenth century, when the existence of the law of gravitation and the motions of the heavenly bodies were denounced by Churchmen as false theories, as strongly and dogmatically as some of the best established geological facts have been questioned in our own days. But time is proving, to those who are willing to learn, that there is as little ground for apprehension to the cause of revelation from the science of geology as from astronomy.

As regards geological science, it must be admitted that the causes of some of the phenomena that present themselves are not so well ascertained and fixed that new explanations may not be suggested to account for them. Such, among others, are the origin of granite, the composition of the atmosphere at different periods of the earth's history, the causes of the effects commonly ascribed to glacial action, and of the position of fossil tropical plants in Arctic regions. These are sufficiently undetermined and open questions to afford legitimate opportunities for new or modified theories and speculations; and until they have passed from the domain of conjecture into certainty there is no necessity for the religionist, who is only called on to deal with established facts, to enter the arena of

discussion for the purpose of either crediting or discrediting the suggestions of the philosopher concerning them.

On the other hand, some scientific facts and principles are so well established that those who are acquainted with them, and who also value the integrity of the Scriptures, cannot disregard them, and shut their eyes to the necessity of bringing them into conformity to what has been written with the pen of inspiration. Thus, who is there, in the present day, with a competent knowledge of geological science, that questions the fact of the succession of the sedimentary strata in the earth's crust; that is to say, that the primary system of rocks preceded the secondary, and that the secondary preceded the tertiary, and that the different formations that make up those respective systems, from the lowest known member of the primary to the superficial deposits of the tertiary, succeed each other in a well-defined order—and that too, although the system of Laurentian rocks has been recently discovered below the Cambrian, which till then was supposed to have been the lowest and earliest deposited of the sedimentary strata?

Again, what geologist questions the progress of life with the progress of time—from the lower to the higher species of animal vitalities—from the lowest known form of submarine life, through the higher forms of submarine life, and upward and onward through reptiles, birds, and mammals, to the human races, though more recent investigations have added a zone of animal life in the subjacent Laurentian rocks? for such discovery has only confirmed and consolidated the principle of progressive creation, inasmuch as the type of animal life that has been developed in these bottom rocks is of the *lowest organization*. Had reptile or mammal remains been found in these newly-discovered rocks, or had human remains been brought to light either there or in any part of the primary or secondary systems, it might be suggested with truth, that the theory of progression is in a sick and dying state. As it is, these additions to our geological knowledge have strengthened the principle of progression, and demand that we should deal with it as an ascertained fact, and not as a doubtful theory. Such loosenings of the foundations of acquired knowledge are as treasonable to the cause of scientific truth as the denial of the divine origin of the Mosaic record is to the cause of Scripture inspiration. Well-established truths of this nature ought not to be discredited, more especially as they tell the same story of the divine *modus operandi* in the creation of life as is told in the first chapter of Genesis—that is to say, that the life-giving Spirit of God poured vitality into the waters while primeval darkness was on the face of the

deep ; that amphibious reptiles and birds succeeded, and were followed by the mammal races, and lastly by the human races, represented in Scripture by their highest type. The book of Genesis and the book of nature, correctly expounded, reveal the same orders of creation ; so that to question the doctrine of the progression of life is to deprive the believers of the most tangible and intelligible evidence that time has ever produced of the divine origin of the Mosaic record of the creation. In dealing thus with primeval history, and bringing it into conformity with ascertained primeval facts, we utilize the first page of the Bible to establish the most important of all truths—the authenticity and inspiration of the Scriptures.

But there are other questions connected with the primeval history of our race, of less importance than Scripture inspiration, but which have proved most attractive to the philosophic instinct that leads men to pry into the secret recesses of nature. It is a common maxim that the Scriptures were not written to teach mankind the physical sciences, God having supplied him with capacity and intellect to work out such knowledge for himself. This is a true and sound principle ; and in all matters of physical science, within the sphere of human knowledge, the Scriptures teach us nothing. No aid is required of them, and none is afforded. But the truths to which we refer are truths which lie beyond the range of human discovery, and which must ever remain matter of conjecture and speculation, so far as unaided human reason and argument are concerned ; and yet, strange to say, in such inquiries and discussions, the only authentic written record of primeval events in the possession of man is ignored, even by many who profess to believe in it as of divine origin. Yet *there* may be found evidences of the truth or falsehood of disputed theories which are not to be found elsewhere, and by which we may arrive at conclusions to which the mere philosopher, with all his scientific acquirements and intellectual powers, can never attain.

The Darwinian theory of *the origin of species* is one of those speculations that can never be proved or disproved by unaided human intellect. The nature of the question, and the discussions it has undergone, prove that man may refine and propound plausible theories on the subject, but that, without a divine revelation, his inductions will not transcend the sphere of conjecture. In this respect, the inquiry is like the Berkeleyan theory of ideas, which occupied attention, and was for many years the theme of controversy among metaphysicians, until it was recognized to be a question incapable of solution, and thenceforth faded out of the field of discussion. The

theory of the origin of species by natural selection, like its predecessors of transmutation and development, is founded on the proposition that, in the furnishing of the earth with its organisms, there has been no interposition of a higher power in the sense of creation, except, perhaps, in a very remote first and undefined step. However philosophers may differ on the subject, the believer in the authenticity of the Bible record has no difficulty as to the true doctrine of the exercise of creative power. He finds it written, and he is bound to believe and uphold it, that when the earth was without form and void, and darkness on the face of the deep, the Spirit of God brooded on the face of the waters—a plain assurance that submarine life was first brought into existence by the direct influence of God's Spirit. And, in the work of the fifth day, there is an equally plain statement that the moving, or, as more properly translated, the *creeping* creatures from *the waters*, and winged fowl—amphibious reptiles and birds—came into being at the bidding of the Almighty. And so, with respect to “cattle and creeping things, and beasts of *the earth*”—the mammal races—they too came subsequently into existence by the fiat of God. And lastly, a man, we are told, was made by the creative powers in the *image of God*, his Creator. Thus we know that as regards the first appearance of each of the great leading families of the animal world—fishes, reptiles, birds, mammals, and man—there was an exercise of the divine will, and a direct interposition of a divine power in the sense of creation. All the animals that are now on the face of the earth may, or may not, have been evolved by natural selection from those first created beings, each after its own kind, throughout the geological eras; and to that extent the Darwinian theory may, or may not, be well-founded; but no further concession can be made by the religionist without surrendering the evidence of creation so mysteriously preserved for his use in the first chapter of Genesis. How many of each class were created does not appear; but sufficient is stated in Scripture to show that Darwin's suggestion, that all vegetables and animals may have been derived from, at most, only four or five progenitors, is without foundation; and that there is no ground at all for his avowed belief that they have all descended from one prototype, from some one primordial form into which life was breathed. So far our old primeval history of the creation has decided, for those who believe in its authenticity, an interesting and important question, which man's intellect and research, without such aid, are powerless to decide.

The unity or plurality of the races of mankind is another of those vexed questions, which has undergone considerable dis-

cussion, and presents much diversity of opinion among philosophers—some contending that all the races of man which are found on the earth, are derived from a single pair of ancestors—others insisting that they have been derived from different pairs of ancestors. Again, those who uphold the doctrine of the unity of race differ from each other as to whether the first ancestors were of the higher or of the lower type, or, in other words, whether the Caucasian is the result of a process of elevation from the lower to the higher, or the Savage is the result of a process of degradation from the higher to the lower type of humanity.

Here the religionist, who has been contending on supposed *Scripture* grounds for the unity of race, will find himself at issue with the philosopher contending for the same proposition on *scientific* grounds—the one assuming that the highest type of humanity was the first in existence, and the other insisting that the lowest had the precedence in time. Neither of these disputants has any right, as frequently done, to rely on the authority of the other in aid of their respective positions. The phrase “unity, or origin, of race” has a different meaning according as it is used by one or the other. The philosopher, on alleged scientific grounds, derives Caucasian man, not merely from the lowest specimen of humanity, but descends to a lower depth to seek his parentage in the monkey, the ape, or gorilla. On the other hand, the religionist derives all the human races, savage as well as sage, as lineal blood descendants from the Adam of Genesis, created in the image of God six thousand years ago, the highest step in the scale of humanity. Does the truth rest with either of these, or is it to be found with those who account for the state of the world by advocating the doctrine of the plurality of races—that is to say, that Mongols, Negroes, and other semi-civilized and savage races have descended from ancestors of similar types, and the civilized man from the man made after the likeness of his Creator; and who alone, by the exercise of his intellectual powers, has found his way into the sanctuary of God’s counsels in His mode of framing and furnishing, sustaining and perfecting, the heavens and the earth and all that is therein? The solution of these questions lies manifestly beyond the bounds of human research and reasoning. How far does Scripture aid the inquiry?

The first chapter of Genesis puts an end to the doctrine that Caucasian man, the great civilizer of himself and others, is the result of a process of elevation from the savage to civilized man; for we are told that Adam was *created* by the Almighty, and in *His own image*—a description wholly inapplicable to au

uncivilized savage. The question is thus narrowed to the inquiry, whether the savage is a blood descendant of the Adam of Genesis, or of ancestors similar to himself. What saith the Scripture?

Our translation of the early chapters of Genesis has, by rendering the word "Adam" sometimes to designate "man" in the abstract, and sometimes the individual Adam, misled those who are not qualified to consult the original Hebrew text, and many even who are, to the conclusion that Adam was the first of the human race that appeared on earth. But a more critical examination shows us that the sacred record is a record of the creation of "*the man*" described as made in *God's image*, that is to say, with superior instincts and capacities that have distinguished his progeny from all the other human races, as is confirmed by all history, sacred and profane, by the science of language, and the mental and physical peculiarities which have ever distinguished the tribes that went forth from the plains of Shinar to colonize and civilize, to multiply and replenish, the earth. This is quite consistent with the existence of inferior races of men on the earth at the time of Adam's creation—and so far, does not contradict the doctrine of the plurality of races. On the other hand, there are well-known statements in Scripture that can only be satisfied by admitting the coexistence of other inhabitants of the earth in the days of Adam, outside the family of Adam—for instance, the appeal of Cain to God for protection when expelled from his father's home, and his building of a city in the land of Nod.

But there is more. The chronology of the Bible is part and parcel of God's revelation to him, and is as much of divine origin as any other statement of Scripture. The religionist must take Adam with his chronology, or abandon him altogether. For to part with Scripture chronology, we must regard the antediluvian patriarchs as mythical personages; and without Seth and Enos, Methuselah, Lamech, and Noah, when and where, in time and space, are Adam and Eve to be found? If their descendants are mythical, it would be difficult to maintain the reality of the ancestors. And if the chronology of primeval times is to be expanded, to get rid of *supposed difficulties*, how many patriarchs are to be imagined and added to those that are recorded in Genesis and by St. Luke as having lived and died between Adam and Abraham? Assuming, then, that the Bible chronology is correct, how do we account for black Negroes, yellow Mongols, and red Egyptians, proved by the ancient monuments of Egypt to have been in existence in large and distinct communities about the time of the exodus, 1500 B.C., unless we are prepared to admit

that they had other progenitors than the Caucasian Adam? The time that elapsed between Adam and the exodus, or, more properly speaking, between the dispersion and the exodus, is altogether too short to account for a change so decided and fixed as that between the Caucasian and the Negro. Prichard, who to the most extensive and accurate knowledge of the physical and moral attributes of the various races of mankind added a due reverence for the Scriptures, avows that the doctrine of unity of race in Adam, which he upholds, is incompatible with the chronology of the Bible. From which it follows that if the Scripture chronology is to be maintained, the doctrine of the unity of race must be given up. We prefer to retain the Scripture chronology, and adopt the alternative of the plurality of races, as the Scripture narrative is thereby preserved in its integrity, and, conceding to the savage another ancestry than that of Adam's race, we escape all the difficulties which arise from the disputed question of the antiquity of man, and account for the existence of those inferior races which are abundantly proved by the geologist and archæologist to have been inhabitants of Western Europe before the immigration of the sons of Japhet, after the dispersion at Shinar.

The authenticity of the Bible ought not to be permitted to rest on the untenable proposition that Africa became peopled with negro descendants of Caucasian Adam in the brief space of time that elapsed between the dispersion and the exodus; nor on the assumption that when the Israelite encountered the negro in Egypt in the days of Joseph, or when the sons of Japhet, carrying out their destiny of multiplying and replenishing the earth, encountered the aboriginal savage in Europe, or, at a later period, in America and Australia, they came face to face with members of their own family, whose forefathers had emigrated to those regions at an earlier period, and had forgotten their lineage, discarded their language, and had become transformed, not only in features and complexion, but in moral capacity and anatomical configuration. It would be difficult to avoid the further step, that, unless the laws of nature are changed, a similar change may be looked for in our own descendants after the residence of a few hundred years in Africa, America, or Australia. Profane history and the Brahminic vedas tell the same story as the Bible, that the Caucasian Greek, Hindoo, and Hebrew were, in the days of Abraham and Moses, physically and intellectually the equals of the highest specimens of modern Caucasians. And what reason can be suggested why the descendants of an early Caucasian emigrant should have become degraded to savages,

that would not apply to sink the progeny of the European of the present day, dwelling for a few centuries in Africa or Australia, to the level of the uncivilized aborigines of those countries? These are some of the considerations that have proved stumbling-blocks in the way of the mere philosophers to a recognition of the authority of Scripture history; and it will be well for the cause of Biblical truth that they should be removed, by confining the primeval records of the Old Testament to the history of *the man* created in the image of God, and his race. Thus it is that the doctrine of the plurality of race is established by the primeval history of Adam's race, which has been preserved for us in the Book of Genesis. We may add that it is also in accordance with the great doctrines of the atonement, redemption, and justification by and through the second Adam, and with all that has been written by the prophets and apostles of things that were, and are, and are to be. But this is not the time, or perhaps the place, to discuss so large and important a subject.

Another question, somewhat allied to the last under consideration, has occupied the attention of philosophers, whose solution is also unattainable by unaided human research and reasoning—the *origin of language*. Some contend that the various families of language throughout the earth have had a common origin, while others insist that they have had a variety of origins. It is admitted by those who uphold the unity of language, that all attempt to *prove* a common origin is *vain and futile*; the utmost that can be maintained is *the possibility of a common origin*. This is the proposition of Boeghtlink, and approved of by Max Müller and Bunsen, all of them strong advocates for the possibility of all languages having had a common origin. The question, therefore, is not to be solved by human reason; and we may be permitted to consult the pages of Scripture to ascertain the true state of the case.

Those who uphold the unity of languages on scientific principles maintain that the order in which they came into existence was, that the agglutinate languages of central and northern Asia, the earliest member of which was the *Chinese monosyllabic*, were the first, and were followed by the family of inflectional languages, which comprise the Indo-European and Semitic languages—the languages of civilization and literature. The more perfect were developed from the less perfect. Such is the basis on which the theory of a common origin of languages rests. Is it confirmed by Scripture?

Adam had a language in the Garden of Eden. The circumstance is specially noted in the second chapter of Genesis.

That language was, of course, of the same family as the language of his descendants, the Hebrews. The language, therefore, of Adam must have been inflectional, and originated within the last 6,000 years, and was not developed from a monosyllabic or agglutinate language. The agglutinate languages must, therefore, have had a different origin; for no one has ever suggested the possibility of an agglutinate or monosyllabic language being derived from an inflectional. It may be said that the diversity of languages may be accounted for as having originated within the last 4,000 years by the confusion of language at Shinar. But a consideration of the tenth and eleventh chapters of Genesis will show that the dispersion at Shinar was a *tribal separation* of the three families of Shem, Ham, and Japhet, for the carrying out of the divine purposes declared concerning them through their father Noah, and was caused by the disruption of the primitive language into the three families of inflectional languages—the Semitic, the Japhetic, and the Hamitic—all of which were at one time in existence, and two of which remain to the present day, to attest the truth of the miracle. The inflectional family of language has existed since the creation of Adam, and was, no doubt, one of those special gifts conferred upon him, and through him, on his race, as a necessary qualification for the great work of replenishing or civilizing the earth, in which they are still engaged.

Let these principles prevail, and let the voice of the mysterious opening pages of our Bible be thus heard in the discussion of such questions as the origin of species, of the races of mankind, and of their languages; and their sound will go forth with a power and authority never before known. The philosopher has hitherto been endeavouring to construct primeval history from the relics of the remote past, comparing them with existing phenomena, ignoring altogether that strange primeval history of our race which has been written and preserved, in a wondrous manner, for our learning. And why? Chiefly, if not wholly, because the sacred record has been interpreted to pronounce dogmatically that the Adam of Genesis, who came into the world 6,000 years ago, was the first born, and progenitor after the flesh, of all mankind, from the highly civilized European to the low and abject Hottentot and Bushman, instead of that section of it represented by the Caucasian, whose mission it was to increase, and multiply, and replenish the earth. This erroneous construction is so opposed to all well-ascertained and settled physical and linguistic facts, as to have been destructive of the authority of that portion of the Scriptures in the estimation of the philosopher. Let the

error be corrected by restoring the Adam of Genesis to his proper place in the procession of humanity, the parent of his own race, and of no other, and our ancient and precious Biblical record of primeval events will be allowed by many who now despise it, to speak with authority, and perhaps to decide some of the conflicting theories which are engaging the attention of the scientific world. Under such influence, the relics of antiquity, now scattered abroad, will come together like the dry bones in the valley, and stand up an exceeding great army of facts, to attest the power and wisdom of the Almighty in His works, and the truth and inspiration of His written Word.

The CHAIRMAN.—I now ask you to give your thanks to Dr. McCausland for his paper, and I shall be glad to hear what any gentleman has to say on the subject.

Mr. POYER.—Dr. McCausland raises the question of the unity or diversity of the origin of race. He inclines to the theory of diversity; and supposes that, if it be accepted, certain chronological difficulties in the Scriptures will be discharged. Now there may certainly be chronological difficulties in the Bible, but it seems to me a matter of still greater difficulty to accept his solution of the diversity of origin. I cannot conceive that the degenerate type of the negro—to take the strongest instance—can possibly have emanated aboriginally from the Godhead. By way of illustration I will put an artistic case. Let it be conceived, if possible, that some daub of a third or fourth-rate artist should be assigned to Raphael or some other great master of art: would not such a suggestion be received with indignation, almost with scorn? Is there not a relation of necessary congruity between every artist and his creation? I can conceive it just possible that in the case of Raphael, through some defect of power, or originating from whatever reason, he may at a certain moment have failed in his art, and have produced something irrelative to his intrinsic capacity, but such a suggestion cannot be referred to the Godhead at all, for God's powers are perfect and always perfect. I therefore incline most emphatically to the theory of the aboriginal unity of the origin of man. Dr. McCausland has referred to the Scriptures in elucidation of his position, but I think the Scriptures are rather more antagonistic than favourable to his theory. We have clearly at the very opening of the record the fact that God created man—or the Adam—in His own image. No doubt we are not restricted to apprehend that statement in relation to an individual Adam, but rather to take it generally:—"Male and female created He them, and called their name Adam." But the fact stated is that He created Adam in His own image; and I am at a loss to conceive in what other image he could have been created. But still there is the fact of declension and degeneration, and we have to account for it. Dr. McCausland refers to Scripture, and I think the Scriptures do throw some light upon it.

Dr. McCausland of course is not unaware of the narrative with respect to Ham, the father of Canaan. I need not trouble you with any extended reference to the fact, which is of course cognizant to all present, and I will therefore only mention the curse which was pronounced upon Ham. Ham had infringed the law of the decalogue ; he had been guilty of filial impiety. When his father had in his infirmity disgraced himself, no doubt filial piety, if it had operated in a noble nature, would have afflicted Ham with sorrow and distress, but it seems to be implied in the narrative that he made a jest of his father's dishonour. That suggests to me that he must then have been in a state of moral declension—in a very low moral condition—or he would have been differently affected by his father's conduct. The result is that a curse is pronounced upon Ham in these words :—"Accursed be Ham ; the servant of servants shall he be to his brethren." That curse took effect. It might not immediately develope the lower type of the negro or anything of that sort, but it resulted ultimately I presume in that degeneracy, and that appears to me to be the only possible solution of such degeneracy. Dr. McCausland says :—

"The time that elapsed between Adam and the exodus, or, more properly speaking, between the dispersion and the exodus, is altogether too short to account for a change so decided and fixed as that between the Caucasian and the negro."

But I find that that interval is one of no less than 847 years, and surely eight and a half centuries give ample time for the development of that low type. There is quite time enough to account for the degeneracy which took place. Then the theory of unity of origin is supported by other considerations. I read in the same record, that God made of one blood all nations to dwell on the face of the earth. One blood—what does that mean ? It means one life, for the life is in the blood—the blood is simply the vehicle by which life is conveyed through the organism. Therefore God made them of one life, and one life is one organisation ; for organisation, I take it, must refer itself to life—the organising force or principle must be life. Then one organisation means one organism, and if that be so, any declension must be explained in some other manner than by diversity of origin. Another thing strikes me, in relation to what Dr. McCausland has said as to the original unity of language. I find it written in a very early portion of the record that the whole earth was of one language, of one speech. That again establishes to my mind—unity of origin. If there was one language, one speech, it implies to my mind essential unity of origin, for with diversity of origin you would have diversity of language.

Rev. C. A. Row.—I shall confine my observations to the last portion of Dr. McCausland's essay, as to how far the science of language bears out the chronology of the Bible ; and my own opinion is, that so far as the science of language has yet gone, it being imperfect, but daily progressing towards perfection, it does demand a longer chronology than 6,000 years from the creation, or 4,000 years from the flood. It is common to study this point

from the history of many languages with which we have a small acquaintance, but I will argue it from languages of a historical character. So far as historical languages are concerned, there cannot be a doubt that their development is exceedingly slow. Take the case of the Greek language. The Homeric poems date unquestionably from a thousand years before Christ, and possibly they are still older. Now these Homeric poems present the Greek language in an exceedingly perfect form, not so perfect as in the days of Pericles, but still very perfect; and the Greek race must have been then a very intellectual race. We can trace the history of the development of the language from then until now; it forms one continuous history. I find that from my knowledge of ancient Greek I can generally make out a great deal of the contents of a modern Greek newspaper, though, of course, I cannot read it perfectly; but it seems that the modern Greek or Romainic more generally resembles the ancient Greek than any other of the modern languages of Europe resemble their prototypes. In the 2,800 years which have passed since the Homeric poems were composed we can trace the Greek language in all its stages, and see very distinctly the rate of progress at which it has developed from the days of Homer until it reached its highest perfection; and then its retrogression from its highest perfection throughout the Middle Ages and down to the present time. It is evident that the development of languages is a matter of very slow growth; but that is not the whole of our evidence. Let us note the development of the modern European languages out of the Latin. They have had very slow progress, although there have been more disturbing influences at work upon them than were brought to bear upon the Greek language in the interval between modern Romainic and ancient Greek. French, Spanish, and Italian are fundamentally Latin. Their whole ground-work is Latin, although they suffered changes and alterations from the irruption of the Northern barbarians in the Roman Empire, and from the contact with Eastern races in Spain, modifying those languages to a much greater extent than has been the case with the Greek tongue, which has been developed naturally; yet the development we trace is very slow and gradual. We must now ascend one step higher. The Greek and Latin languages and the languages of modern Europe are all related, and flow out of a language which was pre-historic to the present Sanskrit, which is a cognate language to the Greek, and they were each respectively developed from a language pre-existing to either of them. When these languages entered Europe they must have come by a migration from some portion of Asia, where that prior language was then spoken, and it becomes a very interesting question as to the relationship which Greek bears to the Latin. The earliest Latin, although undoubtedly a cognate language with Greek, and flowing from a race which must have migrated into Europe, is yet more widely different from Greek in character than the various modern languages of Europe are from their original, and I think we may fairly argue that it would have taken a considerable period of time to develop the Latin and Greek in the various complicated forms which they possess in historical times. But to the whole of those long periods of development of these languages we

must add the time required for the development of the great bulk of modern languages which flow from the same source. By following the Greek language we get carried back to a much earlier period, when the language which preceded both the Greek and the Sanskrit flourished, and that earlier language must have been considerably developed before the people who used it came from Asia, and formed the Greek, Latin, Spanish, German, and the whole batch of modern languages. There must unquestionably have been a considerable period of time for the growth of the Greek language before the period of the Homeric poems, and there must have been a considerable time required for the development of the language out of which Greek and Sanskrit originated before those languages came to be formed. And then the question arises in what relation did that earlier language, which was not monosyllabic, stand to the monosyllabic languages? Altogether I think there is good reason to show that the development of language must have taken a very considerable time.

Rev. S. WAINWRIGHT.—I am very much interested in the topic which Mr. Row has spoken upon, but, no doubt owing to my dulness, I do not quite understand that Mr. Row has given us any opinion as to the relationship of the monosyllabic languages—the Chinese, for instance, with the Semitic and inflexional languages mentioned in Dr. McCausland's paper. That relationship has much to do with the considerations as to the period of time necessitated—

Mr. Row.—I admitted that point.

Mr. WAINWRIGHT.—Then I will quit that part of the subject. I take the whole paper to be an attempt to defend a theory that Dr. McCausland has already maintained with much ability, but which I submit must have a great deal more of substantial evidence in its favour before it can make its way in the world. If you will allow me to say it, with all due deference, I most fully concur in an expression which fell from Dr. Thornton at the opening of this session. He told us that this Society must beware of being theological, but keep to science, and not get into theological disquisitions. Now I endorse that most fully; and though in the discussions of these matters we are at liberty to introduce the Scriptures if we please, we should introduce them as the Scriptures, and as nothing else. Unless the Scriptures are introduced as an authority from which there is no appeal, we had better keep them out altogether, otherwise we only complicate matters; but as we do not come here to discuss the Scriptures, nor to decide other questions by the standard of the Scriptures, we should discuss scientific questions by scientific standards, and not appeal to the Scriptures at all, or else take care that our appeal is fully borne out by the Scriptures. I think that canon of reference is violated in this essay over and over again. For instance, there is a quiet assumption by Dr. McCausland that his doctrine of the plurality of race—

“is in accordance with the great doctrines of the atonement, redemption, and justification by and through the second Adam, and with all that has been written by the prophets and apostles of things that were, and are, and are to be.”

I cannot go beyond the first word without differing from him. We are told that God has made of one blood all nations on the face of the earth ; but I fail to comprehend how that can be so, unless they have had one common ancestor. I only cite this as my reason for differing from the quasi-scientific doctrine set forth in this paper. It fails to present itself in the character here claimed for it, of being in perfect accordance with the great doctrine of the atonement. I know what is said as to the necessity for keeping clear of scientific topics when maintaining the authenticity of the Bible. We are told that the Bible is infallible, but yet it was not given to teach us science. I am always puzzled by that. How do we know that the Bible was not given to teach us science ? I maintain that whatever is given there is profitable for man ; and that the very men who say that are unable to draw the line between the scientific and the moral and spiritual statements in the Bible, when they attempted to do it, and even when in some event they succeeded to their own satisfaction, if not to mine, they always found that the most essential particulars to the maintenance, and growth, and perfection of the moral and spiritual life are wrapped up in the scientific truth of the Bible—that, in fact, the scientific truth is the outwork, and the spiritual truth is the citadel, and you can only surprise the citadel by forcing the outwork first. As in Adam all die, even so in Christ be sure all must live ; but if this theory of Dr. McCausland's is true, all did not die in Adam ; and where is then your revelation as to regeneration ? As a matter of fact, Holy Scripture has declared that God has made all men of one blood ; and that as Adam died, so all men died. If you do not believe that, you have no authority whatever for believing in the universal resurrection of the human species. I find that Dr. McCausland supports his theory by questions. It is exceedingly easy to support a theory in that way. Every man can ask questions which it may not always be easy to answer, and no doubt there are many difficulties in this subject. But I differ from him in the inference that there are no answers which are so far satisfactory as to warrant us in holding the tenability of our faith in the Scriptures. Then I find it stated by Dr. McCausland that when the *Essays and Reviews* appeared, and Mr. Goodwin assailed the Mosaic Cosmogony—

“the equally mischievous article of Mr. Rorison was put forward by the clergy of the Church of England as the best answer that could be given to it.”

But I beg to recall to Dr. McCausland's notice a book of much finish and ability, which contains the best answer to Mr. Goodwin, and which denounces Mr. Rorison's essay as mischievous ; I refer to Mr. Birks's essay “On the Bible and Modern Thought.” Dr. McCausland further says:—

“It follows that if the Scripture chronology is to be maintained, the doctrine of the unity of race must be given up. We prefer to retain the Scripture chronology, and adopt the alternative of the plurality of races.”

But the Scripture shuts you out from the adoption of such an alternative. I think it is far more consistent to say, “We will take the alternative if there

be one, but we will not accept an illusory alternative. We will not be compelled to adopt that which afterwards vanishes from us." Then Dr. McCausland asks :—

"How are we to account for these black Negroes, yellow Mongols, and red Egyptians, proved by the ancient monuments of Egypt to have been in existence in large and distinct communities about the time of Exodus (1500 A.C.); unless we are prepared to admit that they had other progenitors than the Caucasian Adam?"

In answer to that, I would simply say that we do not know two things : we do not know the rate of progress of change in the past periods referred to, with respect to which Dr. McCausland is speculating ; and we do not know the force of the power then in operation to produce those great changes. Nothing could be a more simple and pertinent illustration than such an instance as this : suppose a negro comes here and meets another man whose age he does not know, and whom he has not seen for a year. He says, "I see you have grown an inch since I last saw you ; and as you are now six feet high, you must be, at the rate of an inch a year, seventy-two years old." (Laughter.) It is easy for us to imagine that a negro would make a ludicrous blunder like that ; though, if the negro were here, he might say, "Why do you attribute such gross blundering to me ?" But we have heard the same sort of thing to-night. We have heard it said that the negro is a being of an inferior race ; but the negro himself would tell us that he was made of the original colour, and that we are pale-faced because we have been born under a watery climate, where the colour has been washed out. (Laughter.) It is a fact admitted by Sir Charles Lyell himself,—who must be deemed one of the greatest and most eminent of those who hold the theory of gradual change and of immense periods of time to bring about all the existing phenomena of nature—it is a fact admitted by Sir Charles Lyell himself, who would estimate the ages which have passed by what has taken place on the Scandinavian coasts in the last ten or fifteen centuries, that no period of ages would have been sufficient to scoop out the bed and valley of the Thames. At this very moment it is admitted that when you give these people all the periods they require, they have not got quite enough, but must have something more : there is some flaw in their argument which requires further buttresses and props.

Rev. L. B. WHITE.—There is one point which Dr. McCausland seems to me not to have attempted to make out. Supposing the theory of the paper to be true, that the Caucasian race—the race which comes from Adam—is one made after God's image, and that the other races have not been made after God's image, it is very difficult to understand in what relation those two classes, supposed to be co-existent, stand to one another. I confess I cannot understand how the author can think his theory is agreeable to the teaching and doctrines of Scripture, or to the command to preach the gospel to every creature, which goes upon the foundation that all men were made in the image of God, but have fallen through the sin of Adam. The author also lays it down as quite indisputable that it is impossible to suppose

that the inferior races like the negroes and others could have been made in God's image, though the Caucasian race may have been. Now, I hardly know in what the author considers the fact of a man being made in the image of God consists, or what, in his opinion, it means. I do not suppose it means the mere outward perfection of the human body—that one race was made more beautiful than another; though, if mere bodily perfection was meant, it might be that only the Caucasian race would have been made in the image of God. But I think Dr. McCausland's theory is shown to be fallacious in this, that if you give these men, whatever race they may belong to, the remedy which is provided by God in the Gospel for the raising of man from his fallen state, you will find that whatever their race—whether Negro, Caucasian, Mongol, or any other—they will all be brought up to the same level in all the nobler parts of human nature; and in that I conceive lies the image of God. You will find no difference whatever in the rest, from the Caucasian race under similar circumstances. Separate them from their present influences, and place them in circumstances where they would be likely to fall back into barbarism, which is easy, and they whose superiority is so much vaunted will soon fall below even some of the degraded and despised races. I remember reading, some time ago, an account of the frightful enormities committed in some of the border states of America, in a savage warfare between the Indians and white men who were living almost in the wilderness; and the description given of the acts of some of the white men was so revolting that you could only feel that any one who could so act must have been degraded to our very lowest idea of savage life. At the same time I read a letter from one of the missionaries of the Church Missionary Society in North-west America, a man who was originally a red Indian, but who was taken when a boy in his wild state, and brought under civilizing influences and under the elevating power of the Gospel. I read a letter from him written after he was grown up and settled as a missionary. He described the great affliction through which he had passed in the death of a beloved child, and I would defy any Englishman or any one to have written more beautifully or in a way which would better assure us that the writer was in every respect a perfect equal with the highest forms of humanity. Taking the two cases together, you have in one a man originally civilized, who has been degraded almost to the condition of a brute; and you have in the other a man, originally a savage, who has been elevated, and who is in the highest sense a man in God's own image. And that is also true of other races. Take the records of missionary societies, and read the accounts, not made up by missionaries, but the writings of men themselves who have been savage and who have received the Gospel—such men as negroes and others; and it will, I think, be evident that any theory which says one race is less in the image of God than another will not hold water for an instant—

The CHAIRMAN.—And these changes which you speak of are not produced by successive generations, but in one generation.

Mr. WHITE.—With regard to the question of language, I do not think

Mr. Row gave sufficient weight to the great effect of literature in the matter. If we go back to the Latin languages, we find that in the few years following the great break-up of the Roman empire these languages changed with an almost inconceivable rapidity compared with what they have done since —

Mr. Row.—I think not.

Mr. WHITE.—Take the Italian language as an example. The Italian of Dante, 500 years ago, is the same as the Italian of to-day ; but if you go back for 500 years before that, you will find a great difference. Languages change according to circumstances. Take a book 500 years old in our own language, and you will find it very troublesome reading ; you cannot get on without a glossary. But if you take up a copy of Dante you will read it as easily as you read the Italian of the present day. These things must be taken into account in drawing conclusions as to the immense time which is necessary for the alteration of languages. (Hear, hear.)

Colonel HORSLEY.—Although I am only a stranger and a visitor, and not a member of the Institute, I shall have great pleasure, if I may be allowed, in bearing my testimony to what has fallen from the last speaker in reference to the changes which take place in aboriginal tribes. I have been in India for thirty years, and I have noticed the great changes which take place even in the countenances of those natives who have been educated in our stations. In a short period, even in one generation, there is such a change that you cannot fail to notice it. I have noticed in the schools of the Church Missionary Society how surprisingly low-caste children have been altered by education and the reception of the Gospel. And the same results are to be found even in the hill countries, where the people are the outcasts of society ; but where they have been brought under the influences of civilization by Mr. Baker, missionary in Travancore, they are now showing what education and the Gospel will do for them.

Mr. REDDIE.—The testimony which has been borne by Colonel Horsley is very valuable, and it is entirely borne out by the testimony of Mr. Pritchard, who lived for many years in the Feejee Islands. He says in his memoir, published by the Anthropological Society, that even in the outward appearance of the natives there is a marked change in the lifetime of the individual through the teaching of Christianity. The people become like different beings ; so there is even a kind of truth in saying that the outward beauty of form has some connection with the inward beauty of the spirit, of which, probably, it is in some way a manifestation. The question of rapidity with which these changes go on, whether with regard to physique or to language, requires to be more carefully dealt with than Mr. Row seems inclined for. I do not agree with Mr. Row ; and I give him fair warning that in his paper he must put his arguments on the development of languages well together, or we shall be prepared to do battle with him. If Mr. Row comes forward with an argument on the development of languages, we shall expect him to give us the reasons for that supposed great length of time which that development has required, and not allow him to fall back upon that line of argument which Mr. Wainwright has humorously illustrated by the supposititious case

of the negro who measured a man's age by his inches. It should be borne in mind that in the youth of a language, as well as in the youth of a people, developments are always more rapid in every respect ; and that after a due amount of "shaking down," if I may use such a vulgarism, changes become slower. In early ages, when there was no writing, or when writing was carried on upon stones or tablets, or by means of other modes of a difficult kind compared with the facilities now afforded to us by printing, a tribe severed from its original stock would degenerate very fast, and the changes in its language would become most marked in a very short time. The people would soon forget their original speech in its purity ; and even a peculiarity of tongue or lip in an individual might be reproduced in a whole family, just as in Roxburghshire you have a whole class of people with a particular "burr." Then, with reference to the customs of a people, all those extraordinary customs of savage races, when they were scattered and dispersed over the world, would doubtless tend to give unity to particular tribes among themselves, but would create a great diversity between them and other peoples. With regard to the paper itself, Mr. Wainwright has so ably brought before you the principles we have always maintained, that I find I have less to say than I otherwise should have had. I am of opinion that we should either let the Scriptures alone, or if we bring them forward, we should do so without forcing new interpretations upon them ; and I must say that I am in favour of the first course. What we have got to do here is to investigate various theories of science, and to give especial attention to such as are said to be contrary to Scripture ; and we are bound to examine them not in a way which would satisfy us merely, as believers in Scripture (for that would only do good to ourselves), but upon scientific principles, with reasons and counter-proofs, so as to satisfy those persons who may have been persuaded that what we confute was a true science that contradicts the truth of Scripture. We have already met the arguments of some persons on this particular subject ; we have discussed the unity of the human race before ; and I find no answer in this paper of Dr. McCausland's to any of those hitches in the argument on the other side which I myself brought before the Institute during our first brief session in 1866. It is of no use for any one to bring forward a detached theory and leave out of consideration all the strong points of his opponent's case ; and I think Dr. McCausland's paper is weak in the extreme, if for no other reason, upon that ground. A great part of the arguments that have been brought forward with reference to these inferior races is always based on the assumption that the particular savage you deal with has always been a savage in a low and degraded state, and has not fallen from a higher state ; and a great deal of the argument about language proceeds on a similar assumption, as if language began in a very low and imperfect condition, and marched upwards as it marched onwards. When Mr. Row explains how that is—

Mr. Row.—I am not going to. (Laughter.)

Mr. REDDIE.—Well, I deny that there is any proof that we could have risen if we had sprung from a low origin ; and in the same way I think Mr.

Row's argument as to the time it would take to make Sanscrit and Greek perfect languages out of barbarous ones wants a rational beginning—

Mr. Row.—I cannot see how my argument wants a beginning, because I assume the original form of Sanscrit, which belongs to it, and which also belongs to the twin language, Greek.

Mr. REDDIE.—Yes, but they are both perfect languages, and your argument wants a beginning to prove their lower origin—

Mr. Row.—I apprehend we have proof that they have both of them originated out of a previous language.

Mr. REDDIE.—But even if they have, unless they originated out of a language in a low condition, and were raised up from that, my argument clearly stands good. Whatever periods of time were required for the modification of languages, you must have a rational beginning, and tell us whether they began in a low or in a high condition, just as we must know the same with regard to the origin of savages. Now, with regard to savage races there is no instance of a savage race having civilized itself; but we have constant instances, even under our own eyes, around us, of civilized people degenerating and growing degraded. The *onus probandi*, therefore, lies on the other side. Give me one instance of a savage race that has civilized itself, and then I will admit that we *may* have risen from a low condition, although we have still greater proof that civilization is the older of the two conditions of man; and that subject has not been exhausted. While referring to *Essays and Reviews*, I do not think it is fair of Dr. McCausland to say that a reply put forward under the editorship of the Bishop of Oxford was put forward "by the clergy of the Church of England." Half a dozen men were asked to write a book, and the Bishop of Oxford edited it; but he never previously even read it, and I think that was rather unfortunate for his own credit. Mr. Rorison was one of the gentlemen who contributed to that volume, and he had a notion that the verses of Genesis which narrate the six days' creation were like stanzas of poetry, and that, in point of fact, the six days' account was a sort of poetical mode of division, like stanzas in common poetry; and I consider that view objectionable. It was no reply at all to Mr. Goodwin. But the clergy were not responsible for that. Mr. Rorison himself was the responsible person, and I suppose the Bishop of Oxford avoided reading the papers, in order that he might not be responsible for what they contained; but I do not think that a satisfactory way of conducting polemical discussions. Then Dr. McCausland, appealing to the succession of sedimentary strata in the earth's crust, asks us what geology says as to the progress of life or the progress of time. Well, we agree to a certain extent that there was the creation of fishes of the sea before the land animals; but the question arises, How long did it take to accomplish the whole of creation? I have yet seen nothing to shake my faith in the six days' creation. It is satisfactory to find that the geologists do hold that the oldest animals they have discovered are of an aquatic character, but that explains nothing,—and I say this, although their view would rather confirm my own, for the fact is that the reason the lower grades of animal life are found in the bottom of the ocean is that it is those which

you get in the sedimentary strata, merely because that is where they lived. Dr. McCausland says,—

“Well-established truths of this nature ought not to be discredited.”

I agree with him that no well-established truth should be discredited ; but the question is, What is a well-established truth ? There is an assumption here that Dr. McCausland's own views are true, and that we must not discredit what he has arrived at. But we are bound to examine these things, and not to take them for granted. In the next page he says that as regards physical science the Scriptures teach us nothing ; but he himself seems to think they do teach us something as to the creation of man ; and if that is not part of physical science I do not know what is. Then I must protest against his saying this :—

“The first chapter of Genesis puts an end to the doctrine that Caucasian man, the great civilizer of himself and others, is the result of a process of elevation from the savage to civilized man.”

I will not accept that argument, although the conclusion agrees with my own opinion, because I think it would damage this Institute if we put it forward that we argued merely from the teaching of the first chapter of Genesis. I am only sorry I have not yet been able to redeem a pledge I made to Sir John Lubbock in the Ethnological Society to take the strong points in his paper on the savage origin of man and answer them, or else confess that he has made out his case. There are one or two occasions where Dr. McCausland uses this language :—“*We* prefer to retain the Scripture chronology,” and so on. Those passages should have been expressed in the first person singular : the author of a paper can only speak for himself. When Dr. McCausland speaks of the Scripture chronology as that of 6,000 years, that is by no means granted ; and 8,000 years is about as near as 6,000, according to some chronological interpretations. I know some people who would not think much of the extra 2,000 years which that gives you ; but I am certain that the arguments as to man's deterioration and the alteration of languages will be considerably affected if you have another 2,000 years to deal with. (Hear, hear.)—

Mr. ROW.—It seems to me that you think you must not take the method of advancing from an imperfect language and go upwards to the highest point, but you assume an original perfect language and come downwards.

Mr. REDDIE.—Yes ; because we have the old perfect Sanscrit and Greek—both of them extremely artificial. You have to account for these languages being found in their oldest condition in this perfect form. You have already had explained by Mr. White the rapid change which may take place in a language in 500 years. And Mr. White might have spoken not merely of the Italian language, but of the Italian people ; for the Italians of to-day are no more like the “noble Romans” of Julius Cæsar's day, than they were like the barbarians that invaded them. So you have the same phenomenon in the people that you have in the language.

The CHAIRMAN.—It now becomes my duty to sum up, as it were, the

discussion, and I must say I think Dr. McCausland's paper is one of the most unsatisfactory we have had here. In the first place it is most unscientific ; one cannot make out clearly from the paper itself what particular theory Dr. McCausland wishes to put forward. I do not find his own theory logically stated as a theory ; it is supported by no arguments whatever, and there is no array of facts to deal with. It is with such vague assertions that I conceive this Society has particularly to deal. Let me take up the first principles he starts with with regard to geology. He considers that certain geological questions are so far decided now that any attempt to controvert them is somewhat similar to a profanation of Holy Scripture. He says,—

“Such loosenings of the foundations of acquired knowledge are as treasonable to the cause of scientific truth, as the denial of the divine origin of the Mosaic record is to the cause of Scripture inspiration.”

But I find these very subjects are now matters of dispute among geologists themselves, and considered to be fit and proper subjects for discussion by those who are striving to advance the progress of geology as a science. Geology is one of our most important sciences, and it is in the most imperfect and incomplete state—too imperfect and incomplete to tell us all that may be known concerning the history of the earth. Geology is imperfect because it gives us a very imperfect acquaintance with what may be determined from the present surface of the earth or the scratchings that man is able to make on its surface. We know very little indeed of the geology of the earth's surface. Then we are told that we ought to compare the records of the past with what we find existing on the earth now. But how little do we know of the fauna of the sea. More than ninety-nine hundredths of the fossils in our museums are fossils which belong to marine strata ; but what do we know of the fauna of the sea at present ? We are in a state of great ignorance with regard to all deep-sea fauna, and we are only able therefore to open our eyes to the great imperfection of science. Sir Charles Lyell himself admits, in his most recent writings, that the progress of geology as a science has been kept back by men's attachment to scientific hypotheses—mere hasty generalizations of certain meagre facts upon which men put a certain interpretation ; and the interpretation they put on those facts has caused them to be blind when other facts were brought before them, which other facts they have refused to admit. All those facts that Sir Charles Lyell brings forward are for particular purposes and to support a particular theory or view of his own. He brings forward a series of facts to show you that the progress of recent geology has gone to prove that there is not that distinction which was supposed to exist between the fauna of different strata—that there is a greater degree of interfusing and interpenetration than was supposed between those species. The species supposed to be of modern origin are found in far more ancient strata than was believed, and that is the kind of progress that geology is making. Just recently a discovery has been made which brings down the whole of the first part of Dr. McCausland's paper. Dr. Carpenter has been out with

Professor Thomson deep-sea dredging in the Atlantic, to obtain some knowledge of fauna existing in deep-sea bottoms. We are only beginning to learn that we know very little about the chalk formation, and we have Professor Huxley himself admitting that the animals which form the great mass of the chalk formation are animals still existing in the seas. We are carried back to the cretaceous strata, and there was a suspicion that if we could get a better dredging apparatus we should obtain still more surprising results. They used to let down a quill to the bottom in the deep sea and allow it to penetrate the mud and bring up a small quantity of ooze, and a few quill-fulls were all they could obtain to give them a knowledge of the fauna of the Atlantic! Now they have gone back with a better dredging apparatus: it will not take up a very large animal, but it is better than the quill. Now what was the result of the very first dip? I believe the result has not been made public yet, but I was told to-day upon good authority that it will form the principal part of the opening address of the President of the Royal Society. I asked a good geologist if he could give me information as to what had been found, and I learnt that there had been one species discovered which is identical, not only with one of those found in the cretaceous deposit, but deep down in the lias. One fact like that brings down a host of geological theories, and I protest against the progress of science being stopped by any such dictum as that of Dr. McCausland. I protest against such language being used, as being both illogical and contrary to an unbiassed search after truth. I cannot help believing that the looseness, vagueness, and want of logical accuracy, which appear here with regard to the science of geology, can also be applied to the whole of the rest of the paper. I understand the principle attempted to be made out is the plurality of the races of man in place of man's single origin, and the only reason Dr. McCausland brings forward in favour of his own theory is that if we admit his theory we get rid of all difficulties with regard to Scripture chronology. But if we do adopt it, I do not see that it lessens the chronological difficulty one bit, or makes it one atom easier. There is no hint here of the difficulties with regard to the chronology of the Old Testament, and the great discrepancies between the chronology of the ancient versions—the chronologies of the Septuagint, of the Hebrew, and of the Syriac. The difficulties we have to deal with in the chronology are more of the nature of critical difficulties, and they must be met critically. If you meet those difficulties, you may be able to give all the time he requires to Mr. Row or to Bunsen in his vaguest and wildest conjectures, but I cannot see how the plurality or unity of race is to affect that chronology in the least degree—

Mr. Row.—It does not affect my argument about the time required for the development of languages at all.

The CHAIRMAN.—One would have thought Dr. McCausland would have given us definite and distinct reasons for his belief in the plurality rather than in the unity of race. He leads us to imply that there are the strongest scientific difficulties in the way of admitting the unity of race. He says,—

"The authenticity of the Bible ought not to be permitted to rest on the untenable proposition that Africa became peopled with negro descendants of Caucasian Adam in the brief space of time that elapsed between the dispersion and the exodus ; nor on the assumption that when the Israelite encountered the negro in Egypt in the days of Joseph, or when the sons of Japhet, carrying out their destiny of multiplying and replenishing the earth, encountered the aboriginal savage in Europe, or, at a later period, in America and Australia, they came face to face with members of their own family, whose forefathers had emigrated to those regions at an early period, and had forgotten their lineage, discarded their language, and had become transformed, not only in features and complexion, but in moral capacity and anatomical configuration."

That is the only sentence in which there is any semblance of an argument for the plurality of race, and all it amounts to is this, that in various races there is a difference between them and the Caucasian race in moral capacity and anatomical configuration. Professor Huxley told us in the *Fortnightly Review*, though he spoke contemptuously of the "Adamite" theory, that he had no difficulty, as an anatomist and physiologist, in admitting the unity of race. All the difficulties in his mind were difficulties attaching to the plurality rather than to the unity of race, and there were no arguments which would stand in the way of admitting the unity of race. When we have such admissions from those who are not favourable to anything like a Scriptural view of the subject—when they are obliged to confess that there are no good scientific reasons which can be urged against the unity of the human race, I think those who would impugn that doctrine, and who attempt to establish their opposing theory upon Scripture, are bound to do two things. They are bound to give us good scientific reasons for their theory ; and if they say their theory is consistent with Scripture, they are bound to give us good Scriptural reasons also.

MR. REDDIE.—I forgot to make one remark I had intended when I spoke before. It is with regard to what Mr. Poyer said as to Noah and Ham. I agreed with his general remarks ; but he spoke of Noah in a way which I do not like. Mr. Poyer spoke of Noah's having "disgraced himself." Now I think the context is rather in favour of his having taken the wine for the first time, not knowing its effect ; and no disgrace would attach to him for having thus once drunk wine and been thereby overcome, although, of course, I think there was nothing to excuse the gracelessness of Ham.

MR. POYER.—I certainly did not intend to impute anything disgraceful in the conduct of Noah ; my object was rather to show the disgraceful conduct of the son, by way of accounting for the degeneracy of the lower types.

THE CHAIRMAN.—I have just had pointed out to me that in the very first page of the last number of the *Anthropological Review* there is an answer to Dr. McCausland. The passage runs thus :—

"In the opinion of most of the anthropologists of the present day, it is as yet premature to pronounce, or even to form an absolute decision, upon the question whether man's origin was unique in its occurrence, or accomplished at several points of time or place."

The meeting then adjourned.

ORDINARY MEETING, JANUARY 18, 1869.

THE REV. DR. THORNTON, VICE-PRESIDENT, IN THE CHAIR.

The Minutes of the last meeting were read and confirmed, and the Hon. Secretary announced the election of the following :—

MEMBERS :—G. W. Allen, Esq., Sydney, New South Wales ; A. H. Macafee, Esq., Sydney ; J. S. Budgett, Esq., Ealing Park ; J. J. Shillington, Esq., Belfast ; J. Howard, Esq., M.P., Bedford.

ASSOCIATES, 2nd Class :—C. Dibden, Esq., and R. W. Dibden, Esq., 62, Torrington Square.

The following Paper was then read by the Author :—

*ON THE RELATION OF REASON TO PHILOSOPHY,
THEOLOGY, AND REVELATION. By the Rev. C.
A. Row, M.A., Mem. Vict. Inst.*

IN surveying the modern world of thought, one is much struck by the general tendency towards the formation of two opposing camps. One of these has arranged itself under the Theological standard ; the other, the Rationalistic. Hostilities have broken out, and they are engaged in the work of mutual destruction. Like other wars, this is certain to terminate in the great injury of one, if not of both the combatants.

The question at once arises, Is this war inevitable ? Can it be only terminated by the injury or the destruction of one of the parties ? Cannot each be induced to cultivate the arts of peace within its own dominions ? Has not modern experience shown that near neighbourhood between nations does not necessarily imply a state of natural warfare, and that it is more conducive to happiness that each should be great within its own dominions, and exchange its superfluities by mutual commerce, than engage in the destruction of the other's wealth ? What in this sense is true of nations is true of inquirers after truth. Mutual intercourse rather than inter-

necine war would be far more conducive to their good, whether they are called theologians, philosophers, or men of science. One of the conditions of such a peace is, that they must agree to divide the world of thought in proportion to the rights of the respective parties.

The object of this paper is, to institute an inquiry on what terms such a peace is possible ; what are the proper dominions which belong to reason and theology ; how the border land may be occupied without acts of mutual rapine ; and what are the products of each country, which may become the subjects of mutual commerce.

I object to conceding to the opponents of revelation the exclusive right to the designation of rationalists. It leads to great confusion of thought, and induces numbers to think that there is a natural opposition between reason and theology. It is a term which is properly applicable to all those inquirers after truth who use reason as their instrument of investigation ; and besides reason, the human mind has no other instrument for investigating truth, whether it prosecutes its inquiries in the regions of theology, philosophy, science, or critical inquiry. I am deeply sensible that I am surrounded by ambiguities, from which it will be difficult to keep clear. Our language has not the advantage of the Greek, in having several different terms to designate different functions of that principle which we call reason. We use the word without definite meaning, either in a philosophical or popular sense. Coleridge endeavoured to draw a distinction between the reason and the understanding ; others speak of a distinction between reason and pure reason ; but neither of these has succeeded in impressing itself on language. A numerous class of writers use the terms reason and faith as though they were mutually exclusive of each other. After giving deep consideration to the subject, I am unable to recognize the truth of this distinction. The only one which I am capable of understanding is that which exists between man's unassisted reason and a supernatural illumination imparted to that reason. The phenomena which, in common parlance, are designated Rationalism, are chiefly characterized by an unlimited use of the faculty of conjecture.

It is obvious that our first inquiry must be, Are there any limits to the competency of reason in the discovery of truth, understanding by that term the legitimate exercise of all the faculties of man in their due subordination ? Do the limitations of our minds assign bounds beyond which even the communication of a supernatural revelation is no longer possible, owing to conditions imposed on itself by the action of creative

power? The limits of the one will be found to be coincident with those of the other.

Here let me draw attention to the distinction, often overlooked, between our powers of comprehension and discovery. We may be perfectly able to comprehend a thing after it has been discovered, but may be wholly or partially unable to make the discovery itself. For example, I may be quite able to comprehend Euclid now that all its various truths have been reasoned out, but quite unable, from the definitions, postulates, and axioms alone, to have reasoned out the entire system of geometry which it contains. The disregard of this obvious distinction is one of the grounds on which F. Newman has asserted the impossibility of a moral revelation.

In bringing this subject to your notice, I cannot help alluding to the controversy between Sir W. Hamilton, Mansel, and Mill, on the limits of thought. I shall enter on the subject only as far as is required by the exigencies of the present inquiry. I am aware that Professor Kirk has already partially discussed this subject, but with a wholly different purpose from my own, in a former paper. With some of his conclusions I agree; with others I am unable to concur; while some of them have nothing to do with my present inquiry. My general conclusion, on a review of the whole controversy, is, that the limits of rational and religious thought are the same.

The subject of debate has been much darkened by its having been discussed in an abstract rather than in a concrete form. The question in debate is, Can we form a true conception of the Infinite? Throwing aside the abstract form of the question, if I understand Dean Mansel rightly, he maintains that our conceptions of the infinite perfections of Deity are only true analogously and relatively; and that all attempts to reason on the infinite involve us in hopeless contradictions. Mr. Mill, on the contrary, asserts that our conceptions of the divine attributes must be absolute though imperfect truth; and that our finite conceptions, as far as they go, are correct though imperfect measures of the infinite. He argues that to require a man to believe in an attribute of Deity, the true nature of which he cannot comprehend, is a hopeless absurdity.

My own opinion is that there is a considerable amount of truth on both sides of the controversy. That portion of Mansel's argument is quite sufficient for my purpose which shows that all our attempts to reason on a number of high, transcendental conceptions, involve us in hopeless contra-

diction. When we have reached this point, we have attained the region where it is impossible for human reason to advance, and where a theology or a philosophy resting on a reliable foundation is impossible. In pushing his conclusions beyond this limit, Mansel has given Mill very considerable advantages, which the latter, as a logician, has not been slow to use. If this conclusion is right, that which is denominated the Transcendental philosophy, whether Greek, Scholastic, or German, or whether it exhibits itself in the form of mysticism, as is usually the case when it assumes a religious aspect, is a study where certainty is unattainable.

The ground which I take is, the vagueness and uncertainty of the conceptions on which large portions of the transcendental philosophy rest. This renders us unable to predicate agreement or disagreement between them with any certainty that we are dealing with the substantial realities of thought. As far as a conception in any proposition is indefinite, we are unable to predicate respecting it either truth or falsehood. Such a proposition is a simple nullity. Consequently it is incapable of becoming a fit subject of reasoning; for as all reasonings consist of comparisons of ideas, it is impossible to affirm the agreement or disagreement of those of which we are incapable of forming a clear and distinct conception.

The human mind being finite, it follows that all its conceptions must be finite also. The infinite in its infinity is therefore incapable of becoming a subject for the cognisance of reason. Whenever we attempt to deal with it, I contend that we tacitly assume its finity, and agree with Mansel, that whatever we conceive of, is, by the very act of conception, regarded as finite. The fact that Professor Kirk and Dean Mansel are diametrically opposed on this point proves that we are on the confines of those regions where accurate thought is impossible.

To determine the amount of truth which belongs to either side, we must inquire what is the accurate meaning which we attach to the term infinite. Its use is ambiguous. Sometimes we attach to it a negative, and at others a positive signification. In its negative sense we mean by it simply the non-finite. The actual conception in our minds is a positive finite idea plus the mere negation of its finity. So far we have done nothing to assume the existence of this negation even as a matter of thought. The only conception in the mind is a positive finite one plus a simple negation, which has not yet attained the dignity of an algebraic x .

But when we postulate the existence of infinity, we change this negative term into a positive one. The non-finite, which

was previously pure negation, is assumed to be something carried on without limits, or for ever. We assume its actual existence, although we can never realize it. Thus our infinite becomes our highest conceivable finite conception plus *à ad infinitum*. The constitution of our minds compels us to assume that infinity exists, as in number, duration, and extension. Still, however, we are unable to create any distinct image or conception in our minds. If we call it by the term conception, we can only correctly designate it an indefinite one, which the mind is unable to realize. Are mathematicians able to make their infinities a subject of reasoning as a positive idea? They can only reason about infinity by representing it by a finite symbol. It has been replied that when we thus conceive of an object without limits, we are guilty of the absurdity of asserting that we conceive of it as having limits. The truth is we have no definite conception in our minds at all. What other minds can do I cannot say, but I am wholly unable to form a positive conception of an unlimited thing.

Let us illustrate the subject in the concrete. What do I mean when I apply the term infinity to number, duration, or extension? I take the highest conceivable number, and deny that it represents the possible limits of number. I then assume the existence of number beyond it, and that for ever. I call this an infinite number, but I have no direct conception of that portion of it which lies beyond the limits of the finite. All that I can distinctly image to the mind is a direct conception and a negation. All I can do is to postulate the existence of an infinite number. Still I am as far as ever from being able to form a conception of what infinite number is; because all finite number with which I am acquainted has limit. It may be said that it is still number. I reply that the denial of limit to number takes away an essential portion of the original conception. Mathematicians have methods for approximating the value of infinite numbers; but it is well known that such processes can only be carried on by the use of symbols, which represent infinity under the image of finiteness. It follows, therefore, that although we are capable of postulating the existence of an infinite number, in doing which we advance a stage beyond the conception of the non-finite, we view it as something beyond the limits of our power to image it directly to the mind, and that it can only enter as a factor in any rational process, when the unknown quantity is capable of being represented by a finite symbol.

This will be apparent from an analysis of our conception of space. It is that of simple extension. We can only image it to our minds under some form of limitation. Still, while

this is a condition of our being able to form a distinct conception of it, we are compelled to postulate the existence of space beyond any conceivable definite limit we can assign to it. Still we have not reached a positive conception of infinite space. In attempting to frame such a conception, we must turn a negative one into a positive one. Negation as such cannot be conceived of as existing. What then has the mind really effected? It has been compelled to introduce a conception of finiteness into infinity itself, owing to that law of its constitution that finite thoughts and finite conceptions can only image the finite. If what we designate infinite space merely meant our finite conception pushed on in every direction without limits, Mr. Mill would unquestionably be right, that in adding infinity to finite space, we do not destroy our original conception of it. But in denying its finiteness, or in postulating its infinitude, have we not removed one of the factors in that conception? These remarks seem to me to prove that after we have assumed the existence of the infinite, we have arrived at the region beyond which reason fails to supply us with certitude.

There is a passage in Professor Kirk's paper which leads me to the same conclusion. "Can we not imagine," says he, "that beyond a certain range in the universe, there is nothing? Can we not think this? I insist that I can." My own experience is, that although I can imagine this, yet, after having made many hard attempts, before and since I read his paper, I am unable to think it in any form which is not an airy and unsubstantial one, and I believe that the great majority of thinkers will find themselves in a similar position. "I can think of a perfect vacuum," says he, "and that is nothing. You may say that it is space; but it is empty space, and that is nothing." I am unable to acquiesce in these assertions. Absolute non-existence is to me a thing which I am unable to make the subject of thought. The only thing which I am able to make a definite subject of thought is existence. A vacuum and empty space I can distinctly image to the mind. I can predicate of both of them that they exist. But I cannot predicate of nothing that it exists. The German transcendentalists have asserted the absolute existence of non-existence, and that it is the same thing as existence. This I am unable even to conceive. I only adduce this as helping to show that we have no rational powers which are capable of dealing with such subjects in our present state. They may be enlarged hereafter.

We assume the possibility of the existence of infinity, and ascribe it to God. One portion of this conception is purely

negative—that which denies limitation to His Being. But every positive conception of being which we can frame, can only be imaged to our minds under the aspect of finiteness. Can we by any mental process frame any conception of the infinite as it exists in God? I apprehend not. In speaking of God as infinite, all that I can distinctly image to the mind is some finite conception which I deny to form the limits of His Being. My positive conception of Him is, that He is that finite conception plus something more devoid of limits, which I do not know. In the existence of such a being I believe; but it is impossible to say with any degree of correctness that I can frame a distinct conception of His nature. By the term believe, I mean that there are certain laws of mind which compel me to assume that such a being exists. Beyond this I cannot go.

Dean Mansel and Sir W. Hamilton represent that our belief in an infinite Being is the peculiar province of a function of the mind, which they designate faith, as a power distinct from reason. I am unable to acquiesce in this distinction. Every act of faith, nay, the one in question, is essentially rational. Faith is the final result of every one of our mental processes, when we have arrived at the point at which we make a distinct affirmation. Why the principle of faith should be limited to the admission of the existence of that which we cannot conceive I cannot see; and, above all, how such an act can be viewed otherwise than an act of our reason. Faith is not only an act of our reason, but frequently of our highest reason. I ask, Are not our greatest acts of faith in the highest degree rational? Is not the act of the martyr standing voluntarily at the stake a most genuine act of faith? Are not his convictions in the highest sense rational ones? I admit that there is an aspect of faith which may be said to be instinctive. The belief of a child in his mother is such. But there are two others both rational ones. One is that which we designate by the term *trust*. This is an act founded on our reason; as, for example, our trust in God. The second is the final result of the reasonings and rational processes of our minds. The affirmation of the truth of our conclusions is followed by an act of faith. The author of the Epistle to the Hebrews designates our belief in the being of a God as an act of faith. This is surely a conclusion of our reason.—In treating of the moral attributes of God, Dean Mansel appears to me to have pressed his premises beyond their legitimate conclusions. I should raise the question with him whether they are rightly conceived of as infinite? He has here given Mr. Mill a considerable advantage over him. The term Infinite can only properly be

applied to things capable of a quantitative measure. It may be sufficiently intelligible in popular language to speak of God's moral attributes as infinite; but when we are treating of them philosophically, their correct designation is not infinite but perfect. It is impossible to conceive of truth or justice as admitting of a quantitative measure. I feel great difficulty in applying one to either His holiness or His benevolence. Dean Mansel, however, says that such attributes are the attributes of an infinite Being. This I admit; and, consequently, that they will be affected in the mode of their operation by the infinity of His wisdom. While the Infinite Being must be inconceivable in His infinity, when I ascribe to Him justice, truth, holiness, or benevolence, I do not see how I change the essential conceptions of those qualities, or why they should differ as they exist in God from the conceptions of them as they exist in man.

Mr. Mill declares, in language certainly not a little profane, his inability to worship and reverence a being of whose moral attributes he is unable to form a true conception, and which in their essential nature exhibit different results from the corresponding moral attributes which exist in man. To Mr. Mill's conclusion, striking out its irreverence, I cannot help yielding my assent. Still it requires qualifications. One consideration he has omitted. Moral attributes, as they exist in man, qualify each other's action. On Mr. Mill's principles, we are certainly bound to assume that such a qualification extends to their action in Deity.

It is evident that if I am to feel love, reverence, or adoration for God, these feelings can only be excited by the presence of positive and not negative conceptions of qualities suited to produce them. I cannot feel those affections towards a being who may possess these qualities plus something which may entirely alter their nature or their mode of action. It is impossible to view that as lovely in God which in me would be utterly unlovely; or that as true which in me would be false. Unless I get a positive conception of the moral attributes of God, I get no conception which can produce a moral result in me. It is incorrect and misleading to say that God is benevolent plus infinity. He is perfectly benevolent. Infinite wisdom directs the action of the attribute, and boundless power effectuates the purposes of His will.

Agreeing, as I do, with many of the reasonings of Dean Mansel, it seems to me that he has taken an untenable position in representing our conceptions of the moral attributes of God as merely regulative, or that we can accept them by revelation, while we cannot embrace them by reason. It is impos-

sible for me to feel anything but a very cold love, reverence, or adoration for a being whose attributes are merely conceived of as regulative. To bring such feelings into active play, I want the positive aspects of those qualities. We love Him because He first loved us, is surely no regulative idea. If such ideas had been presented by Christianity as regulative only, she would never have exhibited a noble army of martyrs ; for that it is possible to embrace ideas by faith, while I cannot conceive of them by reason, is to me utterly incomprehensible.

But it is right to face the difficulties of Mr. Mill's view and my own, and I do not think that Mr. Mill has faced them. Admitting that the moral attributes of Deity are the same as those in man, only perfect, we are bound—as in action man's moral attributes are capable of modifying each other—to extend the same principle to the moral attributes of God. If this be correct, it will require a modification of Mr. Mill's conclusions. As God is guided by a higher wisdom than that of man, the outward manifestations of His moral attributes may, within definite limits, appear different from the human. It follows, therefore, that it will be impossible to determine the precise mode of their manifestation on grounds purely abstract.

It is an unquestionable fact, that the universe presents phenomena which our reason, with the limited views which it can take of the moral government of God, is unable to reconcile with the conceptions of benevolence, justice, or holiness, as they exist in man. I shall select only one example,—the existence of evil, both physical and moral. All the efforts which have been made to reconcile this with the infinitude or the perfection of the Divine attributes have proved complete failures. Nor have the attempts to explain away its existence as a fact been more successful. One practical answer is worth a thousand abstract arguments.—We feel it.

If we assume that God could have prevented it, and has not, we assign imperfection to His moral attributes ; if, that He was unable to prevent it, we limit either His power or His wisdom. Some have assumed that it involves a contradiction to assert the possibility of creating free agency, and not along with it the necessity of creating the possibility, nay, the certainty of the existence of moral evil. I cannot see that these two ideas fulfil the conditions of a logical contradiction, which is the only ground on which we can certainly predicate impossibility of Omnipotence. How then are we to meet the difficulty in question ? The facts of the created universe are our only source of knowledge as to the line of action which the moral attributes of the Creator dictate. Beyond what they

disclose, we must assign a limit to the powers of reason, not on the ground that we are unable to attain a clear conception of the nature of the moral attributes of the Creator, but because, as in man, they each limit one another's action, and the infinitude of His wisdom alters the mode of their manifestation, compared with the mode which would be dictated by the finite wisdom of man.—A large mass of the phenomena of the universe afford us unquestionable proofs of the benevolence of the Deity. The only mode of evading the force of these is by denying the existence of design in creation. A subordinate class, viewed by themselves, present us with another aspect. They cannot be ascribed to benevolence, except on the supposition of a deficiency in power. There is only one solution open, but that is a very satisfactory one. We have not the whole case before us, and it is reasonable to suspend our judgments until we have, and abide by that evidence which really preponderates. A child forms a very different conception of what is a truly benevolent action from a full-grown man. To a child a flogging may seem a high act of cruelty. To a wise man it may appear as the highest manifestation of benevolence; still it is impossible that the child can view the act as benevolent, as long as he is only capable of contemplating it as cruel. The answer to the difficulty is, the ignorance of man.—I therefore class the idea of the infinite among the transcendental conceptions of the human mind, which, owing to their indistinctness and indefiniteness, only admit of predication to so limited an extent, that they are incapable of becoming the subjects of reasoning. They may be regarded as belonging to a numerous class of subjects which, in relation to our present faculties, are neither true nor false, but nullities. Of this kind are multitudes of those conceptions by the aid of which certain classes of thinkers have endeavoured to penetrate the regions of ontology, and especially those which are peculiar to the transcendental philosophy, which have been the same in character both in ancient and modern times. The *Timæus* of Plato is a complete magazine of conceptions of this description; so also are the writings of the Alexandrian philosophy, of German transcendentalism and mystical theology. "My mind at least is incapable of realizing the conceptions of these philosophers. This may be owing to my stupidity. If so, it is a consolation to know that it is one which I share with all but a very select portion of mankind; and my scepticism leads me to think that those persons who imagine that they are able to grasp these classes of conceptions, so as to make them subjects of positive thought, are under a delusion. They appear to me to have fallen

into the not uncommon error which identifies muddy water with deep water, and the other equally hasty generalization which asserts that whatever is clear must be shallow.

To form an adequate conception of the rottenness of the foundation on which this so-called philosophy rests, it is necessary to have made it a considerable subject of study. My limits will only allow me to illustrate it by one or two brief quotations. I quote from Lewes's *History of Philosophy*. "The blind and unconscious products of nature are nothing but unsuccessful attempts of nature to make itself an object; the so-called dead nature is but an unripe intelligence. The acme of its efforts, i.e., for nature completely to objectize itself, is attained through the highest and ultimate degree of reflection in man,—or what we call reason. Here nature returns into itself, and reveals its identity with that which in us is known as the object and the subject."

"This function of reason is elsewhere more distinctly described as the total-indifference point of the subjective and objective. The absolute he represents by the symbols of the magnet. Thus as it is the same principle which divides itself in the magnet into the north and south poles, the centre of which is the indifference point; so in like manner does the absolute divide itself into the real and ideal, and holds itself in this separation as absolute indifference. And as in the magnet every point is itself a magnet, having a north pole and a south pole, and a point of indifference, so also in the universe the individual varieties are but varieties of the eternal one. Man is a microcosm. Reason is the indifference point. Whoso rises to it, rises to the reality of things, which reality is precisely in the indifference of object and subject. The basis of philosophy is therefore the basis of reason; its knowledge is the knowledge of things as they are, i.e. as they are in reason."

Of many of the terms of this quotation, I am not ashamed to confess that I am unable to form any distinct conception. They consist of a mass of indefiniteness, of which, as far as I can see, reason is incapable of predicating anything affirmatively or negatively. The sooner they are excluded both from theology and philosophy, the better. It is surprising that large numbers of men ever could have been deluded into the idea that such muddy waters must be profound depths.

A similar dealing with transcendental conceptions—I dare not call it reasoning—induced Hegel to assert the actual existence of non-existence; that Being and non-Being are the same; that contradictions are identical; that subject was object, and

object subject ; that force was the same thing as impotence ; that darkness was light, and light darkness. It is hardly possible to believe that such speculations could have been applauded by crowds of admiring disciples. "It appears," says he, "that the world-spirit has at last succeeded in freeing himself from all incumbrances, and is able to conceive himself as absolute intelligence. For he is this only as far as he knows himself to be absolute intelligence ; and this he knows only in science, and this knowledge constitutes his true existence." The positive philosophy is really refreshing, compared with such speculations. In philosophy they all ultimately end in Pantheism, and in theology in mysticism.

The first condition of a peace between theologians and philosophers must be a distinct recognition by both that the regions of the transcendental transcend the bounds of the human understanding. Theologians must renounce a large portion of metaphysical theology as lying beyond those limits ; and philosophers the whole of their transcendental conceptions, and the greater portion of those which border on them. Each side must be content with the humbler method of induction, deduction prosecuted through the medium of ideas capable of being distinctly imaged to the understanding, and careful investigation. It is incredible what a large portion of so-called philosophy and theology has originated out of stringing together indefinite ideas which exist not in the regions of solid matter but in cloud-land, respecting which the saying of St. Paul is unquestionably true, "Ever learning, but never able to attain to the knowledge of the truth." Such materials were much employed by the controversialists of his day, and ultimately culminated in the Alexandrian philosophy. We may almost pronounce these tendencies to be one of the original sins of the human intellect, as we see it more or less exhibited in the theology and philosophy of almost every nation under heaven.

It seems at first sight marvellous, that, before engaging in such inquiries, it has not occurred to those making them, that it is necessary to ascertain, by a rigid analysis, whether they do or do not lie within the rational powers of man. It is very desirable to measure the profoundest depths of the ocean ; but only one demented would attempt to measure them if he were satisfied that his only instrument for doing it was a line one hundred fathoms long. A vast expenditure of useless power might have been saved in the world of mind by adopting such a precaution. My objection to the whole of these processes is one taken *in limine*, that all conceptions which are incapable of being distinctly imaged in our minds lie beyond the boundaries of rational inquiry.

I have been hitherto dealing chiefly with philosophy. I must now consider the relation in which reason stands to theology, and theology to revelation, and of these latter to science.

I lay it down as a fundamental principle that theology stands to revelation in precisely the same relation as science does to God's creation. Creation supplies the facts of science; and the human mind determines the principles of investigation. Our reason elaborates the result. In a similar manner revelation supplies the facts and principles with which theology has to deal. Revelation and creation are only two different modes of the divine manifestations. As such, they are sisters, and must rest on the same basis of reason, because the mind is incapable of supplying any other. This distinction between theology and revelation is of the utmost importance to enable us to frame clear conceptions on the subject.

The form in which the Christian revelation has been given is unquestionably historical. The function of theology is to investigate, elaborate, and systematize its truths, precisely the same as science holds to creation.

It will perhaps be urged that there is a theology existing independently of revelation, commonly designated Natural Theology. This I concede. But it requires no argument to prove that the only possible basis of such a theology must be a rational one. Theology, therefore, in its widest sense embraces the complete study of the data furnished by God's natural and supernatural revelation, in their bearing on the moral and religious character of man.

We must now determine how reason stands related to revelation. If the principles which have been laid down are correct, the only vehicle through which revelation can be communicated is either reason, or an objective fact capable of addressing itself to reason, as the person of Christ.

The cause of this is obvious. God has limited his power as to the mode in which he will communicate truth, by the conditions which he has imposed on himself in the creation of the finite nature of man. All truth must therefore be communicated through the medium of human thoughts, ideas, and conceptions; in one word, through the instrumentality of reason, which is the sum total of the various powers of the mind.

It follows that those subjects which are incapable of becoming the subjects of rational thought can form no subjects of revelation. If it were otherwise, God must create a new faculty and impart it to man, to enable them to be apprehended.

The want of attention to an obvious distinction has been a fruitful parent of confusion of thought. While it is quite

true that the subjects of revelation must lie within the powers of reason to apprehend, it by no means follows that they may not run up into matters which transcend those powers; precisely in the same manner as while the objects of creation are perfectly comprehensible, many of them involve questions, as we have already seen, quite beyond the powers of reason to fathom. A mystery is a truth, which, as far as it is revealed, is comprehensible; as far as it is not revealed, runs into unknown depths.

Another distinction also should not be forgotten. Reason may be quite capable of distinctly understanding a truth when revealed, which it would have been impotent or only imperfectly able to discover. Multitudes can understand the Newtonian philosophy, who would have been unable to have elaborated it. Those who argue that a divine revelation was unnecessary because many of its truths might have been found out without it, forget this, which, when thus stated, seems to be like a simple truism.

It follows, therefore, that the opposition which we so often hear spoken of as existing between reason and revelation, is utterly untenable. So it seemed to the great defender of Christianity in the last century, Bishop Butler. "I express myself with caution," says he, "lest I should be supposed to vilify reason, which is the only faculty we have, wherewith to judge concerning anything, even revelation itself." And again, "Reason ought to judge, not only of the meaning, but also of the morality and the evidence of Revelation." The opposition exists, not between reason and revelation, but between revelation and the imperfect use of reason. To revile reason, because it is liable to error, or because it is capable of abuse, is much the same thing as it would have been to have reviled the supernatural gifts of the Spirit, because, as St. Paul expressly tells us, they were partial in their operation, and admitted of abuse on the part of those who possessed them.

But it will be said, reason has questioned both the truths and the fact of revelation itself; and has pronounced them incredible, on the ground that they disagree with the conclusions of reason. I answer, that this assertion is hopelessly ambiguous: human reason here means the reason of some particular men, which may be very imperfect. My eyes lead me sometimes into mistakes, those of others which are diseased furnish but very imperfect information; but this is no reason why we should follow the example of *Œdipus*, and extinguish them. If certain things in revelation contradict certain convictions of my reason, this forms a good ground for calling into active

energy other portions of my rational powers, and for investigating the foundation on which both my conclusions and such supposed assertions of revelation rest. A revelation which contradicts reason is at once proved to be incredible.

It is quite possible that a revelation might have been so given as to have contained a theology. As this is obviously not the case with the Christian revelation, we need not discuss an abstract possibility. If we want a system of theology, we must seek it elsewhere than in revelation itself; and the only instrument by which its elaboration is possible, is reason. It must be subject, therefore, to the same conditions as those to which science is subject, use the same *organa* of investigation, and be content to exclude from itself those indistinct conceptions respecting which we can never attain to any definite predication. In our efforts to attain to a true science, philosophy, or theology, it is hardly possible to overrate the importance of instituting such an analysis into the powers of the mind as will determine the definite limits within which its powers are bounded, and which will lead to the exclusion from each of impossible subjects of inquiry.

Many will object, that revelation having been communicated once for all in its fulness, theology must differ from the sciences in being unprogressive. This objection is an extremely popular one, but it is founded on the confusion of thought, by which theology and revelation are identified. I answer, first, that a similar objection lies against the study of creation. Secondly, that it is contrary to fact, for many dogmas which were once supposed to form essential portions of theological truth, have become utterly superseded, as the once prevalent, nay, all but universal belief in witchcraft, which has slaughtered human beings in greater numbers than many a destructive war; and the disbelief in the possibility of the existence of antipodes, of the truth of which theologians were once as confident, as in modern times many have been of the utter falsehood of geology. The advance of human knowledge and the establishment of a better system of investigation, have cleared up many a dark cloud which once brooded over the surface of theology, and I feel confident that like influences will be attended with similar effects in years to come. Have not multitudes of eminent theologians in bygone ages believed that persecution was a religious duty? The advocates of this are now as few as they once were numerous. Such examples may be almost indefinitely multiplied.

As this subject is one of the greatest importance, and it is impossible in this paper that I should fully argue it, I shall shelter my position that theology ought to take rank among

the progressive sciences behind the authority of that great thinker, Bishop Butler. In part ii., chap. iii., of the *Analogy* he writes: "And as it is owned, that the whole scheme of Scripture is imperfectly understood, so if it ever comes to be understood before the restitution of all things, and without miraculous interpositions, it must be in the same way that natural knowledge is come at; by the continuance and progress of learning and liberty; and by particular persons attending to, comparing, and pursuing intimations scattered up and down, which are overlooked and disregarded by the generality of the world. Nor is it at all incredible that a book which has been so long in possession of mankind should contain many truths as yet undiscovered. For all the same phenomena, and the same faculties of investigation, from which such great discoveries in natural knowledge have been made in the present and last age, were equally in possession of mankind several thousand years before. And, possibly, it might be intended that events as they come to pass should open and ascertain several parts of Scripture."

If all had been like-minded with Bishop Butler, much of the quarrel between men of science and theologians might have been avoided. Modern science can have little more to ask than the above admissions. I need hardly observe, that the bishop places the study of theology on the same basis as the study of nature.

I maintain therefore that it is most dangerous for theologians to declaim against the use of reason in the study of theology, or to assert that philosophical or scientific research is in danger of conducting us to infidelity. Let them, by all means, exhort both themselves and others to the use of reason, under a sense of profound responsibility. Let philosophers and theologians alike, admit that it is an imperfect instrument, and strenuously labour to improve its methods. But the outcry against reason itself, as that it is a dangerous instrument for the investigation of any kind of truth, reminds one of the old story of the woodcutter, who ascended a tree one morning for the purpose of lopping off its limbs. His zeal at the work of demolition was so great that, forgetting that he was standing on one of them, he hit it several sharp blows with his axe, which brought it to the ground, and himself also. Thus he succeeded in bringing down the limb, but his success was attended with the fracture of his own neck. Our reason is fallible. Granted: but that is no reason for refusing to walk by its light, when we have none other to guide us. Rather, it is a good one for zealously trying to correct its defects. If we will not guide ourselves

by the light of reason, we can only direct our steps by the darkness of prejudice.

But we must go a step further. I agree with Bishop Butler that the only faculty which man has by which he can investigate the contents of revelation itself, or its nature and tendencies, is that of reason; and that it is the duty of reason to apply this test to anything which claims to have the character of a divine revelation. The whole process by which those who declaim most against the use of reason in the study of revelation is a rational one, only differing from others of the same kind by the assumption of premises of which no evidence exists. We can only persuade ourselves that we can quench the light of reason by invoking its aid in doing so. If in our despair of truth, we take refuge in the assumption of the existence of an infallible authority, the very constitution of our nature compels us to invoke the aid of our rational powers in this act of intellectual suicide.

When, therefore, the friends of revelation denounce the use of reason, and speak of its profane efforts to pry into matters of revealed truth, they do infinite mischief to their cause. Many theological writers, who should have known better, have given countenance to this delusion. From them men of science have got hold of the false impression that theology does not rest on a rational basis. They forget that the only processes by which they have attained to their own beliefs are rational ones; and that that which they denounce, as far as it is untrue, does not rest on a rational, but an irrational foundation. This state of mind is closely connected with that which leads to the convenient assumption that all orthodoxy is my doxy, and that all heterodoxy is every person else's doxy. Every one who thinks at all must apply his reason, not only in yielding assent to any particular system of theology, but in his study of revelation itself. The question is, not about the instrument which we must use, but its character, and the method of using it. On investigation it will be found, that the limits of our rational thought are those of our religious thought, and that the limits of religious thought are the limits of rational thought; and that the ground of the supposed opposition between reason and revelation is the attempt to push our inquiries beyond the boundaries of rational thought.

As a large portion of the sciences, and many of the deductions of philosophy, rest on a basis which is short of actual demonstration, so a large portion of theology occupies a similar position. Perhaps it will be impossible ever to give to any portion of theology the precision which belongs to the pure

sciences, because these latter have to do only with two conceptions, extension and quantity. These are conceptions which admit of the utmost clearness of predication ; and where they do not, they can be represented by symbols, which in their results admit of the greatest certainty of re-translation into the conceptions which they represent. This is not the case with any portion of truth which belongs to theology.

Theologians are often in the habit of laying to the charge of science that all its conclusions are not strictly demonstrative, and therefore uncertain. Scientific men also frequently return the compliment by denying the rational character of theology. This much resembles the old story, which tells us that on an occasion the poker remonstrated with the tongs for its blackness. It is probably true that there is not a science which is in every point absolutely and theoretically demonstrative. Even Euclid must come under that condemnation, owing to the fact that the twelfth axiom, and probably one or two others, are not pure intuitions. But does the imperfection of the last axiom lead any one to question the absolute truth of any of the propositions which rest on it? What, I ask, is the position of theology? Do not the great bulk of its truths rest on a basis less self-evident. And what is the basis on which the Christian revelation rests? I answer with Butler, on a basis not of demonstration, but of various degrees of probability. Those whose beliefs rest on probable evidence have no right to find fault with others whose beliefs rest on the same foundation.

But are these systems, therefore, not sciences? Can nothing be a matter of reasonable certainty, unless it rests on a basis of pure demonstration? If we assert this, we cannot stop short of Pyrrhonism. Some persons think that they can aid the cause of theological truth by throwing discredit on the demonstrative character of the sciences. We are told that even the truths of astronomy do not rest on a basis which is actually demonstrative; and that the conclusions of astronomers in one age have had to be corrected in another. I am at a loss to know what benefit can come from this to theology, such large portions of which rest on evidence which, though highly probable, is not demonstrative. Still less is it becoming in the mouth of the defender of divine revelation. The taunt admits of an effective *tu quoque* reply. We Oxford men believe in the existence of many sciences, which are far from being demonstrative, such as logic, moral philosophy, political economy, even politics and rhetoric. We are ready to concede that their conclusions are not absolutely, but only for the most part, true; still they are suited to be the guides

of human life. As Butler says, "we must be content with that degree of certainty which is attainable by man." If it is urged that the conclusions of scientific men have shifted, may it not be replied that the conclusions of theologians have shifted to a much greater degree? With Butler I speak of religion in general, and of Christianity in particular.

If, therefore, the evidence of religion is only probable, though it amounts to a probability of the highest character, it is far from being an innocent amusement to throw in the teeth of science, that a large portion of its evidence is of a similar character. Here, if any where, the saying is applicable, that those who dwell in glass houses should not throw stones. The result has been, that a large number of valuable windows have been broken on both sides, from the neglect of taking heed to so obvious a precept. To demolish an opponent by the sharpness of our logic is a most pleasant operation; but my pleasure in doing so is greatly modified when I know that I can only obtain this satisfaction at the expense of demolishing myself. A breadth of view, and the taking of all the circumstances of the case into consideration, are far more conducive to the discovery of truth than mere logical power.

I make these observations in reference to one of the great controversies of the day, that between Geology and Scripture, with a view of suggesting caution to the combatants on both sides. Many geologists assert that this science disproves the claim of the Scriptures to be a divine revelation. Many theologians retort and say, "Your science is not demonstrative. Many of its so-called truths have shifted." It is unquestionable, that the geologist can here use the *tu quoque* argument with considerable effect.

Let me put the case fairly. Let it be conceded that geology is not demonstrative; that some of its facts have been shown to be not true; that it is a young science; has had some hasty generalizations; and that some of its theories have shifted. But in what direction does its evidence look, not in this or that particular detail, but taken as a great and comprehensive whole? Towards what point are its little rivulets of truth flowing? After all which can be said against it, it must be conceded, that many of its leading principles rest on evidence of strong probability; and that this evidence points to one fact, that the material planet is more than of the age of from six to eight thousand years. The question therefore at once presents itself,—which is more probable, that our chronology, as supposed to be deduced from Scripture, may be an incorrect deduction, or that this general probability towards which the wide range of geological evidence

points, and which is believed in by many of the acutest intellects, and most laborious investigators, is a delusion?

It seems to me most unwise and unphilosophical to stake our belief of the truth of Christianity on the assertion, that it falls to the ground unless we can maintain along with it that the age of the planet does not exceed from six to eight thousand years. Have we that certainty of our existing modes of interpretation, as to render it necessary that we should take up this position, especially in the face of the science of language, which is, as yet, imperfectly elaborated, but which is making daily progress in the same direction; and tending, when elaborated, to throw additional light on the history of man? The necessity of doing so, arises from the belief in a chronology, which, to say the least of it, has been elaborated by human reason out of the Bible on data which are far from certain; from the acceptance of a particular mode of interpretation as, beyond all possibility of question, the only true one; and from a particular theory of inspiration. Butler on his principles would have pronounced such a position to be one fraught with danger, and would have recommended holding the mind in a state of suspended judgment.

I wish to hold the scales of justice even between scientific men and theologians. It seems to me, that both are far too much in the habit of dogmatizing where they ought to investigate, and that they ought to assert their conclusions with a modesty becoming the imperfection of our instruments for the investigation of truth. One of the chief grounds of the alleged opposition between reason and revelation, is the assumption, both by theologians and philosophers, of a large number of *à priori* principles, which are neither self-evident in themselves, nor capable of being deduced with certitude from those which are; nor are those used by theologians anywhere expressly stated in the pages of Revelation. I must content myself with giving a sample of each; and, first, on the side of the opponents of revelation.

One of the most important of these is the oft-reiterated dogma, that a divine revelation is in its nature impossible prior to all necessity of inquiry into its evidence. When he assigns his reasons the objector has recourse to a number of abstract metaphysical propositions, which either belong to the regions of transcendentalism, or involve a *petitio principii* of the whole controversy. One of the most noted of these is the denial of the possibility of miracles. Probably, everything has been said on this controversy which can be said. After a calm survey of it, it is clear that the attempted proofs of this position involve an assumption of the point at issue. To prove

it, it is necessary to assume that God, if He exists at all, is impersonal, and devoid of freedom; for it requires no demonstration that if a personal God exists, miracles are not abstractedly impossible. The assertion of the absence of personality and will in the universe is a pure dogma, ending in pantheism; for the truth of which reason supplies no proof. If the issue be raised as a matter of fact, whether a miracle has ever been performed, this is a question which is purely historical.

I now select one from theology, the *à priori* dogma of verbal or mechanical inspiration, as the only view of inspiration consistent with the truth of revelation. It is on the assumption of its truth alone, that the ordinary objections alleged by scientific men against revelation have any potency. When scientific men attack revelation, it is not too much to assume that they derive their ideas of what inspiration must have been, from the assertions of theologians.

The arriving at some definite conclusions respecting this question, and the establishment of a rational mode of Scriptural interpretation, are a necessary preliminary to a good understanding between science and theology, as well as a condition of the existence of a scientific theology.

On what does the dogma of verbal or mechanical inspiration and its kindred theories rest? I answer, not on inductive inquiries into the facts and phenomena of Scripture, but on certain *à priori* principles. All those with which I am acquainted have been shown by Bishop Butler to be utterly groundless, when tested by the phenomena and facts of creation; and if we were to erect a universe in conformity with them, we should produce one very different from that of which God is the author. He long ago saw the utter untenableness of this theory on *à priori* grounds. I am quite satisfied to explain my views in his own language, and again to shelter myself behind his authority. The passage is too long for me to quote in its entirety. It is in part ii., chap. iii., of his *Analogy*, and I earnestly commend the whole text and context to your consideration.

"Those observations," says he, "relating to the whole of Christianity, are applicable to inspiration in particular. As we are in no sort judges beforehand, by what laws or rules, in what degree, or by what means it were to be expected that God would naturally instruct us; so on the supposition of His affording us light and instruction and revelation, additional to that which He has afforded us by reason and experience, we are in no sort judges by what methods or in what proportion it were to be expected that this supernatural light and instruc-

tion would be afforded us. . . . In like manner we are wholly ignorant what degree of new knowledge God would give mankind by revelation, or how far, or in what way, He would interpose miraculously to qualify them to whom He should originally make the revelation, for communicating the knowledge of it, or to secure their doing it, to the age in which they should live; and to secure its being transmitted to posterity. . . . Nay, we are not in any sort able to judge whether it were to have been expected that the revelation should have been committed to writing, or left to be handed down, and consequently corrupted by verbal tradition. But it may be said, a revelation in some of the above-mentioned circumstances would not have answered its purpose. I ask, what purpose? It would not have answered all the purposes which it has now answered, and in the same degree; but it would have answered others or the same in different degrees. And which of these were the purposes of God, and best fell in with His general government, we could not have at all determined beforehand." I only regret the impossibility of transferring the entire passage to this paper.

It follows, therefore, that it is impossible to determine this question on *à priori* principles; and if Scripture is silent on the point, or nearly so, the only mode of investigation is the application of the principle of induction to the facts and phenomena of Scripture. When we have ascertained their true character—*i. e.*, allowed the Bible to speak for itself—the theory which will precisely cover them will be the true theory of inspiration. Such a mode of investigation, *mutatis mutandis*, is the same which is applicable to every branch of human knowledge.

If such a mode of investigation should prove that Scriptural inspiration is confined to the communication of religious truth, and does not extend to points of human science, and such subjects as man's unaided powers can discover for himself, a large number of the difficulties arising out of the controversy immediately disappear.

The general principle which I lay down is, that we are in no sort able to determine, on *à priori* principles, what would be the amount of knowledge which God would communicate in giving a revelation—whether it would be much or little, perfect or imperfect; or what instrumentality He would employ in its communication—whether it would be one purely divine, or one largely mixed up with a human element; or in how large a proportion, or in what manner, that human element might be allowed to enter into its contents.

When we say that it is necessary that every portion of a revelation must be equally the result of a divine operation, as every other portion; that there cannot be degrees of inspiration; that a human element cannot exist there; or that God must have acted in this or that particular manner, it seems to me that we are placing ourselves on precisely the same basis as that of the so-called rationalist.

Next comes the question of interpretation. A large portion of our difficulties arise from the want of a sound canon of interpretation, and from inattention to the real character of Scriptural language. I will illustrate from the opening chapters in Genesis. The supposed opposition between science and these chapters arises from the rigid application of the literal principle of interpretation, and the denial that they can contain anything parabolical or figurative. It is said that a day must mean a literal day of twenty-four hours. If so, why must not the serpent mean a literal serpent, which was more subtle than any beast of the field? It will perhaps be said that we learn from inspiration itself that it was not so. We have such information, or rather a hint of it, in the New Testament; but I am not aware that the Old Testament gives us the smallest intimation that it was the devil, and not a literal serpent. On the strict principles of literalism, the Jew could never have divined this. If it is not necessary to understand by the serpent a literal serpent, the principle of literalism respecting these early chapters must be abandoned, and our only guide to their interpretation must, as Butler intimates, be reason, common-sense, and a gradually increasing knowledge, and not *à priori* theories. I can well understand the opponents of revelation insisting on interpreting these chapters to the letter, but not so its professed friends.

Let it not for one moment be imagined that I am advocating an unlimited, figurative, or mystical interpretation of the Bible. I am deeply sensible of the madness of such a course. To say that all Scripture admits of a mystical sense is equivalent to saying that it has no certain sense whatever. By the application of such a method it is possible to make it mean anything we please. I remember once taking up Krummacher's *Israel's Wanderings in the Wilderness*. I succeeded in getting as far as the part where he assigns a spiritual meaning to the names of the places of their encampment. It so happens, owing to our imperfect knowledge of Hebrew, that a few of these places bear a double meaning. Krummacher finds a spiritual sense, and even a place in the spiritual life, corresponding to this double meaning. The supposition that the names might have a spiritual meaning

is within the regions of the possible ; but when I found that a state in the spiritual life could be discovered corresponding to an ambiguous meaning of a Hebrew word—an ambiguity which did not exist in itself, but which simply originates in an uncertain knowledge of the language,—I considered that all further study of a work, based on a principle so fundamentally rotten, was superfluous. If such works are pious, they stand on the same basis as that to which the name rationalism is given as a reproach. Both alike are constructed, not on principles of reason, but of imagination. I advocate neither the literal nor the metaphorical, nor any one single mode of interpreting a book so various as the Bible ; but the application of sound sense, sound reason, accurate investigation, and enlightened criticism, with all the aids which can be supplied by collateral knowledge of the subject. The whole subject is one which deserves the most accurate scientific investigation, and is worthy of the most powerful intellects concentrating all their powers for the purpose of constructing a definite organon of interpretation.

It is a matter, therefore, of the highest importance for allaying the feud between theology and science, that an organon should be constructed, laying down sound rational and definite principles of Scriptural interpretation, and that the nature of its inspiration should be ascertained, not on *a priori* principles, but by a painstaking examination of the assertions and the facts of the Bible itself. Until this is done, the dogmatism of the theologian with respect to science is premature ; and when it has been accomplished, I doubt not that, as the alleged disagreements between the results of scientific research and revelation which have disturbed former times have disappeared, by the establishment of more rational principles of interpretation as applicable to the Bible, so those of the present time will disappear also.

A little of that caution which is practised by Butler would be highly beneficial to both parties in this controversy. The spirit of premature dogmatism may be extensively charged against both theologians and philosophers. Another fault is an impatience of holding the mind in a state of suspended judgment. The work of theorizing is far easier than that of careful investigation, and from the fact that theology enters on many questions which go to the profoundest depths of the human understanding, it places us under great temptations to the indulgence of this spirit. Besides, theology, as it is popularly understood, labours under another disadvantage. While few men would think themselves competent to pronounce authoritatively on scientific questions

without some pretence of having studied the subject, multitudes judge themselves competent to deal extemporaneously with the most difficult questions of theology.

But before closing this essay, I wish briefly to draw your attention to one most serious aspect of the question, viz., the war which many are waging in the name of reason, not against the outworks of revelation, but against the historical reality of the representations given us in the New Testament of the Divine Author of Christianity Himself.

The principles of historical criticism are gradually working themselves into a scientific form, though it would be premature to assert that they have yet attained to the accuracy of a science. Still it is indisputable that many important canons have been established of unquestionable validity, which have led to the rejection of a great deal of what, in former times, was falsely designated history. Many old historical works were composed with the smallest possible sifting of historical authorities, or any attempt to ascertain their relative value. Writers who had taken a party view, or who in an uncritical age had acquired popularity by the charm of style, had succeeded in stereotyping their views on the history of previous ages. An attention to style rather than to truth is one of the greatest faults of the ancient historians. Their critical powers were small and their credulity large. I know of no more striking illustration of the uncritical mode in which the study of ancient history was pursued, even until times comparatively recent, than Rollin's *Ancient History*. We here find the good and the bad placed together in inextricable confusion.

It is not too much to say that, prior to the present century, the state of history was in a most unsatisfactory condition. The character of ancient history was thoroughly misunderstood. In this country historical investigation is a plant of later growth. Many of us can remember the character of the books which were put into our hands at school as histories of England. Of the larger histories Hume, with all his errors, was the best work in existence. But the times are changed for the better. The work now called "*The Student's Hume*," as far as I can judge, is not an abridgment, but a rewriting of the original. If the condition of English history was bad, ancient history was worse. Large portions of it consisted of a congeries of improbabilities.

If the birth of a healthier school of historical criticism dates at an earlier period, we may assign the general recognition of its principles as a result of the labours of Niebuhr. Since his days, the belief in the old so-called histories as correct reports of facts, is become impossible.

The principles of this school of historical criticism have a negative and a positive aspect. The negative portion of the system consists in an examination of the authorities on which the received views of historical truth rest, and the rejection of those views which are based on no historical foundation. For example, it was found that the belief in a large portion of the received Roman history rested on the testimony of authors who lived several hundred years after the events which they professed to record; and although some of their authorities might be called ancient, they were quite modern compared with the events themselves. It was also discovered that the fathers of Roman history had but few written sources of information, and that such as existed were of a very meagre character, and that their reports were founded on traditions, poems, and annals of very questionable authority. As it would occupy too much space for me to enter on this portion of the subject, I must refer to what I apprehend is the best manual of historical criticism existing in the language, the works of Sir G. C. Lewis. I can only express my regret that he did not live to give us a complete organon of historical criticism, and to reduce its detached rules and canons to a scientific system.

This negative side of historical criticism, although it is capable of being pushed too far in incautious hands, is one of considerable validity. It has now been carried into every region of historical inquiry; and to it we are indebted that large numbers of incredibilities have now taken their proper place in the regions of the fabulous. Though I have called this the negative side of historical criticism, it has a positive aspect. It has disinterred a large number of important facts, and placed them on a solid basis of evidence as historical truths.

But Niebuhr also thought that he could establish a positive method of a very different character. It seemed very hard to the inquirer to be obliged to abandon to the regions of uncertainty so large a portion of the history of man. Niebuhr thought that he could reconstruct history out of the mass of ruins under which it had been buried, through the crumbling of materials in past ages. It would be impossible for me to give here a full account of the principles on which this attempted reconstruction was based. It will be sufficient to say that one of the chief instruments relied on was to supply the gaps of history by plausible conjecture, which, if I recollect rightly, Niebuhr called the power of historical divination. It will be evident that the number of theories by which these gaps may be covered over, though not actually indefinite, are very numerous. One person could theorize as well as another,

and the number of theories as to what ancient history had been soon became legion. I submit that this method is based on no sound rational foundation. Some of these guesses may be more or less probable, but they never can be made to rest on any certainty of evidence. Science, too, has her theories; these, after they have originated, admit of being again brought to the test of an ever increasing array of facts, but there are no facts by which to test those of which I am speaking beyond those on which they are erected. Niebuhr compared his faculty of divination to the case of a man who had been shut up for a long time in a dark room. In time the eye gets accustomed to the light, and acquires a power of discerning objects which, to a person suddenly introduced into it, would seem incredible. Niebuhr thought that a similar power of intuition could be acquired by the mental eye getting accustomed to the dim light of ancient history.

It seems to me that the analogy is a false one. I do not deny that long meditation on the materials and uncertain lights of ancient history might enable a man to make many more or less plausible conjectures. But that such a power can avail to reconstruct what has actually perished is impossible. The worthlessness of the method has, I think, been established by Lewis beyond all contradiction. Similar principles to those of Niebuhr have been applied by Bunsen and numerous other writers to extensive fields of historical inquiry, and to the history of Egypt in particular; and the result is that where real building materials fail them, they have composed their structures of sand. These have been demolished by the next theorizer, and so on for ever.

Are we, then, to be compelled to abandon the hope of the reconstruction of history? I fear so, except as far as we can do it by the light of positive evidence. Where that fails, we must be content to leave the large gaps in all their naked deformity. Viewed on the negative side, the principles of historical criticism are of the highest value, but, like other human things, some of them are imperfect and liable to abuse. They have delivered us from the danger of mistaking shadows for living men. After the demolitions effected by the negative side of criticism, our hopes of reconstructing the past lie in the discovery of fresh evidence. This must be patiently waited for; it will probably be more or less perfectly supplied by the elaboration of a science of human language. As the organisms of previous races have been preserved in the rocks by being entombed in them, so man's mental activities have been entombed in language, and many of them will be disinterred in their proper season.

As the Christian Scriptures are of an historical character, they are fair subjects for the application of the principles of historical criticism. No well-informed Christian will wish that it should be otherwise. All that we can require is, that nothing but its strict canons should be applied to them; and that considerations wholly alien to its principles, such as a number of *à priori* dogmas and mere conjecture, should not be imported into the controversy. Abstract metaphysics have nothing to do with historical inquiries. These are simply matters of evidence. By the aid of conjecture and imagination we can create novels, but we cannot write histories. It is impossible to dignify this process by the term rational, and its use is no less illicit on the negative than on the positive side of criticism.

There is no piece of history which will better stand the test of the application of the fair principles of criticism than the four Gospels. They also furnish very large data for the exercise of that criticism. I know of no eminent man in ancient or modern times, of whose life and actions we have four accounts, all written, even on the showing of our opponents, so near the times of the events which they profess to describe, and which all historical evidence must place at a much earlier date. But taking the date assigned to them by the German critics, the latest of them comes within the period which Sir G. C. Lewis has assigned to that of authentic history. When we consider that these are supplemented by four letters of St. Paul, of which no one presumes to question the authenticity, written certainly within less than a period of thirty years from the death of the Author of Christianity, we possess data for historical criticism which we shall in vain seek for elsewhere. But this is not all. The form of the four Gospels, which I think belong rather to the class of memoirs than histories, is of the most unique description. They embrace, speaking roughly, the last three years of the life of our Lord. Three of these contain a parallel narrative of the same events, and, what is still more important, a three-fold version of the same discourses. Nowhere else within the same limits can there be found equal materials for the application of the established principles of historical criticism. The application of these principles to the Gospels, although the result may not be satisfactory to the believers in verbal or mechanical inspiration, will place them on the highest level in point of evidence as authentic histories.

But the so-called rationalist does not confine himself to the application of the principles of historical criticism. He supplements them by a number of *à priori* dogmas, which are

neither self-evident, nor capable of deductive proof from such as are; unites facts by theories, the truth of which it is impossible to verify; supplements all defects of evidence by an unlimited licence of conjecture; and as all historical evidence is probable, and not demonstrative, he marshals one side of the evidence, and carefully omits all notice of the other. In adopting this mode of procedure, he assumes the functions of judge, jury, plaintiff, counsel, and even that of defendant. If he can succeed in getting these offices all united in his single person, it is a hard matter if he cannot make out a case. We might do so against any fact which ever occurred on similar principles. Two thousand years hence it will be possible to show, on the principles in question, that the ministry of Lord Derby had nothing to do with carrying the Reform Bill of 1867; and that all the reports in Hansard, which state that they were active agents in it, are of a purely mythic origin.

I cannot think it fair to bring a charge against rational inquiry into the character and evidences of the Christian revelation on the ground, that a large body of critics, professing to use reason as their instrument, assert that the Gospels are mythic, and the character of the Divine Author of Christianity unhistorical. It does not follow, that rational inquiry is not the only true way of ascertaining their true nature, or that it necessarily leads to such a conclusion. The critics in question profess to found their views on the principles of pure reason. But the question is, Is this profession borne out by fact? Is the unlimited use of theorizing and conjecture a rational process? Are their abstract principles founded on sufficiently extensive inductions, and do not most of them involve a plain *petitio principii*? Does the existence of discrepancies,—put it, if you like, contradictions,—in historical accounts, discredit the immense mass of positive evidence of their truth? If the Gospels had been free from a miraculous narrative, we should never have heard of the speculations of the Tubingen school. Grant the possibility of miracles, and even these critics must admit that the Gospels stand on a foundation of evidence such as no other events in ancient history can pretend to.

Two well-known works of this description are the lives of Jesus, by Rénan and Strauss. It is not too much to say of these that they are novels, and not histories. Their positive portions are the results of conjecture and historical divination in its most arbitrary form. Their negative portions are founded on the principles I have described, and none other.

It is high time that we should recognize the entire rottenness of the principle of conjecture as applied to the reconstruction of history. I have recently read through Bunsen's

Life, as well as his *God in History*. Both these works contain things of the highest value, especially the latter; but it is painful to observe the effect which the endless licence of conjecture, arbitrary theories, and the transcendental philosophy have produced on the mind of that really religious and zealous man. His belief in the transcendental philosophy seems greatly to have dimmed his vision as to the distinction between the subjective creations of the mind and the objective facts of history. His unlimited trust in theory, conjecture, and the certitude of his own supposed mental intuitions, has betrayed him into beliefs which we might under other circumstances have assigned to the most unlimited credulity; such for example, as his belief in the philosophic value of mesmerism, clairvoyance, and second sight, and his discovery from the Evangelists and apostolical writings, that they do not represent that Jesus Christ rose from the dead; but that He partially recovered from the effects of crucifixion, gave Peter His last instructions in a secret interview, left Judea for the purpose of preaching to the Gentiles, and died shortly afterwards from exhaustion in Phœnicia. It is refreshing to know that some men's hearts are sounder than their heads, and this was the case with Bunsen; but to dignify such speculations by the term of Rationalism is to invite confusion of thought. It may be said that many other speculators, including Swedenborg, were men of mighty intellect. I shall not deny it; but their imaginations upset the balance of their other mental powers; and the rational man is he in whom all the powers of the mind are exercised each in its due place and proper subordination. It is absurd to dignify by the term rational, or rationalistic, the transgression of these limits. Transcendentalism, mysticism, and the unlimited use of conjecture for the purpose of creating facts where history fails to supply them, are the brothers of credulity. Let theologians, philosophers, men of science, and historians, beware of these three deadly sins of the human intellect, and we shall hear less of the alleged disagreement between religion and science.

I must now bring this paper to a close, although there are many other points which ought to be included in it, and some notice of which is almost necessary for its distinct elucidation. A paper like this cannot have the distinctness of a treatise. Let it therefore be taken for what it is,—an essay, in Lord Bacon's sense of that word, in which I have taken a very rapid survey of several of the most important subjects of human thought. I trust, therefore, that it will be discussed as such, and not as a work in which I have carefully elaborated those subjects, viewed them in all their manifold complications,

and qualified them by the insertion of other truths, which have been now necessarily omitted. If in the course of the ensuing discussion additional light can be thrown on this subject, which is certainly one of the profoundest interest, none will rejoice more than myself.

The CHAIRMAN.—I am quite sure we shall agree in at once returning our best thanks to Mr. Row for the thoughtful and interesting paper with which he has favoured us this evening.

Mr. POYER.—It will not, I think, be doubted that Mr. Row has presented for our consideration a most interesting and momentous subject ; and it is with considerable diffidence that I, as a layman, venture in any way to differ from any of the positions laid down in the paper. Mr. Row, with regard to the present aspect of intellectual society, refers us to the active antagonism which he truly says is now going forward. He says society presents itself in the array of two hostile camps, one of which he designates as theological and the other as rationalistic. He deprecates that antagonism, and seems to think it should be obviated, and that it would be well if a truce could be proclaimed. He says, by way of illustration, that geographical contiguity affords no reason for natural warfare ; and in that I quite agree with him. But we find as a matter of fact that when the passions of men are excited, our own antagonistic principles are aroused, and geographical boundaries are put quite out of the question, whether they be near or far. Antagonistic principles will and must assert themselves, and they must come under discussion in order that their true nature may be apprehended and known. I cannot for my own part understand that a true Biblical theology can be at all considered as having any relation to rationalism. As I understand rationalism, it is a defect of reason—reason divorced from faith, and coming under the power of sensuous direction, and under the limits of sensuous interpretation. I think we have a signal illustration of this in a work somewhat famous—I refer to the *Essays* of Dr. Colenso, Bishop of Natal. How does he arrive at his conclusions ? By this very rationalism—by the elimination of the supernatural element in Divine revelation. It is true that he tells us in parts of his essays that he does not object to miracles, and to the supernatural element ; but practically we find that he does undoubtedly dispense with the Godhead very largely. He does not see God in history where we find abundant evidence in revelation that He was. Mr. Row at the close of his paper has introduced the names of Rénan and Strauss ; and their rationalism is referable to the same cause—reason is divorced from faith. Now it appears to me that if reason is to have play, or to come into action at all in respect of Divine revelation, it is necessary that it should be preceded by faith. He that cometh to God must believe first that He is ; and that is the attitude, the necessary attitude, in which we should stand to the Divine revelation. We should first synthetically take it by faith, and then we may analytically examine its relations,

facts, principles, doctrines, and so on. So much for the first point. Then I do not quite apprehend the relations of faith and reason as put by Mr. Row. I find him saying,—

“Faith is the final result of every one of our mental processes, when we have arrived at the point at which we make a distinct affirmation.”

Now I should suppose that that sentence required “judgment” or “conclusion” to be substituted for “faith”:—faith is a precedent condition. Even mathematical deduction presupposes intuitive evidence; and what is intuitive evidence but the evidence of faith? Take the case of visual conception as applied to St. Paul’s Cathedral as an illustration. If we limit ourselves to the original act of conception, do we see St. Paul’s in all its amplitude? No. We have a very small picture on the retina, half an inch, more or less, in extent. Yet no one who looks at St. Paul’s doubts that he sees that cathedral in all its amplitude, in all its beauty, in all its proportions as it truly appears, just as though he had climbed all over the whole building and measured every inch with a foot-rule. Now if you analyze that, you cannot say that perception is a mere act of the sense of vision—it is much more an act of faith upon that sense. We must not restrict faith, I take it, merely to the apprehension of spiritual objects and their divine relation: there is a much larger meaning than that to be attributed to the word. In order to make good this position, let me ask what is faith? Is it not the unity of sense and reason? Take an illustration of what I mean. You cannot analytically determine the relation of a part to the whole, and say “the whole is greater than a part,” until you first synthetically take the whole. That is our attitude in regard to divine revelation. We must first be content to put ourselves reverentially, devoutly, and loyally on the affirmative side, and then we may discursively and analytically examine into the whole depth and length and breadth. And here I would make a passing observation in reference to Coleridge. Mr. Row says,—

“Coleridge endeavoured to draw a distinction between the reason and the understanding.”

I assume that Mr. Row differs from that course of procedure—

Rev. C. A. Row.—No, I only used that as an illustration.

Mr. POYER.—But I think, in justice to Coleridge, it should be stated that he gives great reason for the distinction which he draws; for he uses reason as the intellectual faculty, judging according to sense, while the understanding is limited to sense not so emancipated or allied to the higher faculty of faith or of moral reason. Then I come to the discussion raised with respect to limits—whether we can or cannot know, whether we do or do not know, the infinite. That discussion has been pursued at some length, as Mr. Row tells us, by Dean Mansel in one of the celebrated Bampton Lectures, and also more recently by Mr. J. S. Mill, in his review of Sir W. Hamilton’s Philosophy. The subject is full of difficulty; but when we are told by Dean Mansel, who follows Hamilton and applies certain negative

doctrines of Hamilton's Philosophy to theological principles—when we are told by him that we cannot know the infinite, I do not hesitate to say that the doctrines of Dean Mansel tend to beget in us an infinite despair. For I find our great Lord and Master telling us that our life, our eternal life, is actually conditioned upon our knowledge of the infinite :—"And this is life eternal, that they might know Thee, the only true God, and Jesus Christ, whom Thou hast sent." But I apprehend there is some confusion here : the infinite of Dean Mansel is not the moral infinite of the Bible ; it is a certain mathematical infinite, an abstract conception of his own mind, and such an infinite we do not desire to know. The term "infinite," used as a mathematical term, has only relation to quantity and no relation to the spiritual. Mr. Row says that by the substitution of the word "perfect" instead, we may discharge the difficulty ; but I do not see that that will do. Is not God infinite in wisdom and power ? Clearly He is. It is said we cannot know that because we are finite ; but it must not be forgotten that we are affiliated with the Godhead—

Mr. Row.—You are arguing just what I maintained. I have said the infinite is a quantitative measure.

Mr. POYER.—I was referring not only to what you said, but to Mansel's and Hamilton's doctrines. I agree with Mr. Row that in this controversy Mr. Mill (though I do not think him an ideal philosopher) has the advantage in regard to the possibility of our knowledge of the infinite ; but when he goes beyond that he is very curious, and weak, and foolish. What is his theory with regard to matter ? Why, matter is "the possibility of sensation" !—i. e., he says the city of Calcutta is a possibility of sensation ! However, do not let us get involved in metaphysics, or we shall not be able to escape in a hurry. And now before I sit down I have only one other word to offer, on transcendentalism and mysticism. These are very large words and very deep words, and they mean very much. I do not think they can be altogether disposed of by mere verbal proscription. I am astonished at one thing Mr. Row has said in reference to Hegel. He says,—

"A similar dealing with transcendental conceptions—I dare not call it reasoning—induced Hegel to assert the actual existence of non-existence ; that Being and non-Being are the same."

Now that seems very like a paradox hard to get over, but I must say Hegel makes it perfectly plain and intelligible from his stand-point to any cultivated mind. But the objection to his fundamental postulate is not so much the paradox, but his assumption of being as an abstraction.

Rev. Dr. IRONS.—I have not had the advantage of reading this most admirable and suggestive paper before I came here this evening, but all that I have heard of it has attracted me very much. But while I feel that I can thoroughly sympathize with the main conclusions of Mr. Row, there are many details in the paper on which, as they were read, I should have been glad to comment at the moment, but I have not marked them down, and when so long a paper is read one forgets at the end the exact points which

one would have liked to have said a word about. This is a feeling in which most hearers of so elaborate a paper will entirely sympathize with me. We have after-thoughts which remind us of what the French call *l'éloquence de l'escalier*,—that is, a man often recollects, when going down the pulpit stairs, a capital thing he had intended to say in his sermon. (Laughter.) The points to which I should perhaps be disposed to take exception will be in all probability more likely to raise debate than any other, and therefore I may as well mention them at once. One of the points on which I should differ from Mr. Row is as to the mode in which the infinite was regarded. I must confess that I deprecate altogether the dealing with this present world as though it were made up of nothing but phenomena. If you altogether eliminate general ideas, and what people call abstractions and transcendentalism, you would find it a very difficult world to manage, and the common sense of mankind would soon be altogether stranded—

Mr. Row.—I have not been led into metaphysics.

Dr. IRONS.—No, you have not; but there is some divergence between your views and mine; though perhaps it is only a different way of putting the same thing. The relation of faith to reason was another point where I somewhat differed from the general view of Mr. Row. I do not think it is a wholesome or a right thing to lay down that faith is a distinct faculty—a something to be resorted to altogether apart from the domain of reason—

Mr. Row.—That is the very thing I assert and maintain.

Dr. IRONS.—You do so, but still not in the way that I am now desiring to bring out. I understand you to speak of the human reason as making its conclusions independently and by itself, and then leaving faith to take its own course afterwards entirely apart from it. Now I, for one, am a perfect rationalist myself. (Laughter.) I am made so; I cannot help it. I feel that if anything is put before me contrary to my reason, or in collision with it, I shall be a downright hypocrite if I accept it. If any man tells me I must submit my reason to authority, I am as uncomfortable as possible. I believe the God who gave me faith gave me reason also, and somehow or another they must always go together. It is our bounden duty nowadays to come into collision with the opponents of revelation on their own ground. There has been a great deal too much flourishing of late. The attitude hitherto taken on both sides reminds one of the old rhyme :—

“The Earl of Chatham, with sword drawn,
 Stood waiting for Sir Richard Strachan;
 Sir Richard, longing to be at 'im,
 Stood waiting for the Earl of Chatham.” (Laughter.)

There has been a great deal of that sort of thing between the supporters of revelation and the opponents of revelation. The one is afraid, and the other dare not; and they therefore do not come to an issue. I am most anxious that the Victoria Institute should bring matters to an issue. Do not let any one on any side suppose that Christian men are afraid of taking up any

point whatever to which reason fairly and legitimately leads them. I complain deeply of those opponents of revelation who call themselves rationalists, and yet make large assumptions from narrow and insufficient premises, while they are afraid to face all the facts. If they can bring the same accusation against us, they are free to do it; but instead of that I find they are always sneering at the clergy in place of reasoning with them. In one part of Mr. Row's paper there are certain statements as to the mystical interpretation of Holy Scripture which I may refer to. It is in reference to the temptation in Paradise, and Mr. Row is of opinion that nobody, apart from the interpretation of the later Christianity, could ever have divined that the serpent was the devil, or anything but a literal serpent. Now I venture to say that it was far otherwise. In the Targum of Jonathan the temptation in the garden of Eden is attributed to the devil——

Mr. Row.—I was confining myself to the strict letter of the Bible—of the Old Testament.

Dr. IRONS.—But the letter of the Bible never did stand alone. There was always a strong interpretation deemed as authoritative and divine as the letter itself, and it is to that which St. Paul refers when he says: "The letter killeth, but the spirit giveth life." Throughout the Old Testament, and in parts of the New, if we want to understand the spirit at all, we must have the traditional meaning incorporated with the letter. I should apologize to Mr. Row, considering that the paper is so carefully and admirably constructed, and so full of great and deep thoughts—I should apologize to him for dealing with it in this sketchy way; but when I assure him that I came here with my mind full of other things, and even then only heard part of his paper, I know he will forgive me, and excuse my differing from him on one or two points.

THOMAS PATERSON, Esq.—I should like to say a few words to express my great admiration for the paper, and my conviction that if the generality of the clergy and religious teachers throughout the land were to deal with the great questions before them in the spirit in which this paper has been written, there would soon not be much of what is called rational opposition left. But unfortunately that is not so. With regard to the paper itself, it seems to me that on this question, dealing with the infinity of God and the possibility of the human mind being able to grasp it, we fall into two or three errors. In the first place, if we take the Bible as a revelation, no one can think that the Jews, great as many of their thoughts were, had any such idea as we have of mathematical infinity. Their idea was directed rather to the perfection of certain attributes, and not to their mere extension as a matter of space, number, or power. The quarrel with Mr. Mill is rather this, that supposing we accept perfection as the figure of infinity present to the inspired writers, Mr. Mill denies that perfection altogether, or denies the possibility that the human mind can appreciate it. Thus, in reference to Sir William Hamilton's *Philosophy of the Conditioned*, speaking of our ideas of number and quantity, he attempts to refer them to constantly repeated impressions received by the senses. He says it is quite possible

that our conception that two and two make four has arisen from seeing four objects combined a great number of times. But suppose any mathematician should get it into his mind that two and two are equal to five, or equal to three and three-quarters ; that would quite annihilate Mr. Mill's whole superstructure——

The CHAIRMAN.—But I believe Mr. Mill conceives the possibility of two and two making five in some other world. (Laughter.)

Mr. PATERSON.—Yes, I believe he does ; and I suppose that is his idea of perfection. (Laughter.) Now I will take an extreme case : suppose we cannot conceive the idea of perfection, why, the whole, not only of our theological science, and of our conception of perfection, but the whole foundation of our physical science falls over. As every mathematician knows, geometrical demonstration does not depend on any diagram or drawing of lines, but on certain conceptions of form which must be perfect. Mr. Mill's great discovery that all our ideas are received from the external world, and that they must entirely fall short of perfection, is a thing that should be combated. Suppose the infinity of God is accepted as an infinity of perfection, we may believe that the human mind can grasp the idea of the infinity of that perfection, although we do not deny that it is one of the marks of the human mind that it takes an imperfect impression from the senses. But there is one thing in Mr. Row's paper which I think is rather dangerous, and that is at the close. I do not think Mr. Row has sufficiently drawn the line between the literal and symbolical interpretation of Scripture. There should be some canon of criticism. If you say we are to use our common sense in these matters, and then say of any passage, "This is the true reading, and you must reject every other as too literal," you put it in this way, that every person is not possessed of common sense, or, if all persons are, that common sense is so liable to be distorted and led aside that they cannot thoroughly and clearly exercise it. If you do not have some canon of criticism, you cannot escape from the wild views of Swedenborg and others, whom I respect, but whose idea of interpretation—I cannot call it a principle—I cannot accept. Too much figurative explanatory comment about the sacred book would entirely destroy its truth and reality——

Mr. Row.—I am afraid you do not bear in mind what I have said on that point:—

"I advocate neither the literal nor the metaphorical, nor any one single mode of interpreting a book so various as the Bible ; but the application of sound sense, sound reason, accurate investigation, and enlightened criticism, with all the aids which can be supplied by collateral knowledge of the subject."

Mr. PATERSON.—But the qualifications are general. If they could be embodied in a canon of criticism in a more definite form, they would be very valuable in the investigation of truth. Dr. Irons has told us that the letter of the Bible does not stand alone. Now it seems to me that if we take the Bible as a whole, and intend to accept it as a revelation, we cannot so accept it as a revelation, except so far as we understand it. To take it synthetically

by faith, and then to examine it, seems to me absurd. I cannot believe any more than I can comprehend and understand. Mr. Poyer says he can accept St. Paul's Cathedral synthetically. Now I accept as much as I see ; and if you ask me for details, I must see them before I have any faith in them. Now the Bible is presented to us as a revelation, just as the great facts of nature are ; but many of the facts of nature are apparently deceptive ; they come to us apparently saying that which they do not mean. Is it not true that the first believers in astronomy had good reason for saying that the sun went round the earth ? Yet they were wrong, although they founded their belief on a fair interpretation of facts which were before them. Just in the same way many other facts were presented to the first believers, and they made true or false interpretations of them according to the facts and circumstances of which they had knowledge. But it appears to me that the Bible, with regard to all moral truth, contains in itself its own interpretation, while in regard to physical truth it should be interpreted by the facts of external nature, which should be taken with it as enlarging our views of the Divine Being, and giving us facts which we could not otherwise have got at.

Rev. Dr. Rigg.—I feel very much obliged to Mr. Row for this very valuable paper. It appears to me that Mr. Row has made some effort—but I do not mean to minify it,—I will say a comparatively successful effort, towards supplying that which Dean Mansel should have supplied in his Bampton Lectures, but did not. As far as I understand it, this is a sketch of the argument before us in its main propositions : That faith and reason are mutually inclusive ; that, in fact, justly understood, they imply each other ; that faith and reason coalesce, even with regard to the objects of the two respectively ; that the infinite is equally, in a just sense, the object of faith and the object of reason ; that those two—faith and reason—are to be harmonized eventually upon the basis of induction ; and that the basis of induction is the only basis on which we can attain clear and articulate harmony between faith and reason in their respective definitions, objects, and spheres. That is the general scope, as I understand it, of Mr. Row's paper—

Dr. IRONs.—Are you right in saying that the reason can recognize the infinite, according to Mr. Row's paper ?

Dr. Rigg.—In a just sense, I so understand it.

Mr. Row.—My paper simply questions the possibility of obtaining a quantitative sense of infinity, but not any other sense.

Dr. Rigg.—I think I have given the scope of the paper as to faith and reason in their respective spheres and definitions. Confusion always arises from our want of defining the different senses in which we use the word faith. Now all reason has for its basis some faith, but the highest faith has for its basis much reason. I think Coleridge made great confusion by the way in which he used the word reason. He used the word to signify everything he conceived to be accepted by the heart or by intuitions ; and hence he held that that initial faith which lies at the root of vision, and at the root of every exercise of sense ; that that faith which lies at the root of every intellectual

judgment,—for there does lie an axiomatic faith at the root of every judgment ; that that faith which lies at the root of every moral judgment ; and that ultimate faith, the result of all, by which we grasp eternal realities, were but different exercises of the self-same faculty of reason. All these he spoke of as pertaining to the reason as distinguished from the understanding, thus confusing the whole subject. Now, while there is a certain general resemblance, there are such essential distinctions between these various exercises of reason, some lying at the beginning of all thought, and others at the perfection of all thought, that should have led Coleridge to a scientific distinction between the various kinds of faith, or exercises of intuitive reason. Mr. Poyer did not sufficiently bear this in mind when he spoke of our receiving St. Paul's Cathedral as an act of faith. That is a complex kind of faith, which we do not receive all at once. The eye, in every act of vision, sees something and holds to it ; but yet what the eye sees is not that which the mind comes to realize. An infant, we say, sees its father ; but what the child sees is not a complex living person, but merely an image upon the retina ; and there is a process of acquired conceptions and associations of a complex character before the child has lost that first imperfection of childish perception and acquired all that belongs to the ordinary powers of vision, so as to realize at once the objects which come and go before it. This will clear away some misconceptions. Then, with regard to faith and reason being harmonized, I agree with much that Mr. Row has said. I believe that faith—when we come to the higher faith, that faith which apprehends and grasps eternal verities—must in a sense repose upon the basis of reason. If you reduce and narrow that basis too much, you will cut away the ground upon which all the defences of revelation itself must rest from beneath your feet. We must all be rationalists in one sense, and I regret that the term “rationalist” has been absorbed by a party which makes out reason to be contrary to faith. I deeply regret that. As for faith and reason in their respective spheres, again I believe I am correct in saying that Mr. Row has tried to teach us that the infinite was to be apprehended equally by faith and by reason, each on its own account and after its respective manner——

Mr. Row.—Certainly.

Dr. Rigg.—At the same time, I agree with the gentlemen who have said that the mathematical infinite has nothing on earth to do with the moral infinite. It only introduces a confusion into the subject which is quite needless. What can the mathematical infinite have to do with any moral or metaphysical argument ? When you apply the term “infinite” to mathematical or physical science you are almost guilty of an abuse of terms. As for infinite space, I think it can be nothing more than an infinite deal of nothing. (Laughter.) It would seem to be nothing else than emptiness conceived as a possible condition of being—as a possible condition of matter. The more we talk of infinity, the more we are puzzled and bothered by terms which have no significance. As to the moral infinite, we should entirely relieve ourselves from all difficulties introduced into the subject by these references to a mathematical or quasi-material infinite. I am not prepared to give up the

use of the word "infinite" in its application to the Most High. It is a fine, noble word, and I take it to mean the fulness, the fontal fulness, of all perfection ; and so regarded, we must apply it in a just sense, and in the only just and true sense, to the one Everlasting Supreme Being. As to Mr. Mill, we can hardly any of us undertake to criticise him lightly, although he has said that two and two in some inconceivable world may be equal to five. It appears to me that four means two and two—that it simply means so many units taken one after another ; and when you analyze four, which is fair according to Mr. Mill's philosophy, and get at its meaning, you must come to two and two ; and that, by his own principle of analysis, you never can make four otherwise than equal to two and two. That is to say, if A is equal to A, four is equal to two and two, and five can never be equal to two and two. But Mr. Mill had the advantage in his argument with Dean Mansel, and, moreover, he is much more nearly allied to those who are transcendentalists than they are willing to imagine. He is an idealist, perfect and pure, as much as ever Berkeley and Hume were, and a nihilist as well as an idealist, if it be possible to conceive the combination ; but he is not the least in the world a materialist. He no more believes in matter outside of him than he believes in me as a unit apart from matter. I confess I think the real principle at stake has been indicated by Mr. Row, and that is, that all is to be harmonized on the basis of induction. But I think Mr. Row went too far in his endeavour to show how, in the philosophy of probabilities, reason and faith melt into each other. He tried to make us understand that demonstrative sciences were in part sciences of probabilities, and that therefore it should not be alleged against theology that it is simply a probable science. Now, I should be disposed to invert that statement. I do not believe it can be pretended that the demonstrative sciences, properly so called, are based on probabilities. I believe that Euclid's demonstrations are based on absolute axioms—

Mr. Row.—I have referred in my paper to Euclid's twelfth axiom as not being a pure intuition.

Dr. Rigg.—Well, I only state my own opinion that Euclid's elements are based on clear, absolute axioms. And I go further, and say that the physical sciences repose on axioms and on principles which are as clear and certain and axiomatic as any principles of mathematics ; and, just as in any mathematical problem you may have conditions uncertain and unresolved, and can only come to an approximate conclusion, so in physical sciences you may have more or less of your conditions that are uncertain, and which only enable you to come to approximate conclusions. My argument is this, that physical sciences repose on intuitive principles, and so do all sciences, whatsoever they may be ; and I reason in this way : You should harmonize faith and reason, not by making the demonstrative sciences appear to be merely probable, but by showing that metaphysical or moral science, no less than the demonstrative sciences, repose on a basis of intuitive axioms and intuitive principles. The conclusion that I come to on the whole is this : that if we take the principle of induction,

which I apprehend is the only working principle on which any science whatever can be tested, we have as much right to apply that principle to our own theology and to matters of faith, as men of science have to apply it to the elements with which they deal. I think that passage of Mr. Row's, where he intimates that you can only deny miracles by going off the basis of inductive science, is very true and penetrating. That is what Strauss and Rénan do; and it underlies all the *à priori* criticism of a particular school. When you depart from the basis of induction, which was Christ's own method, you end in pantheism, and nothing but a foregone conclusion as to pantheism can justify any one in denying the probability of a miracle. Resting on that, I think we may come, as Mr. Row has said, to such a theory of inspiration as all parties are bound to accept. Let us take the phenomena and the facts; let us analyze them, and find what inspiration is. It will be a difficult process, but it is the only one by which we can ascertain the truth as to our theology.

MR. REDDIE.—It is now so late that I feel I should be acting very unwisely were I to occupy much of your time; I must therefore pass over much minute criticism which I had intended to give Mr. Row the advantage of, and will limit myself to a few observations on important points. And first, as to the general antagonism which Mr. Row has noticed at some length in this paper as between the theologians and the scientific men,—I am not aware that theologians have taken exception to science as science. I have heard them refuse to admit certain so-called sciences to be true science; and I am sorry to say I have heard some theologians refuse to admit reason in matters of theology; but they are a small and diminishing, if not already extinct, party, and we may leave them out of consideration. The warfare which Mr. Row speaks of is not with those theologians who deny reason, but rather with those who are supposed to deny science; and I must say that as regards that war I do not want peace. But I do not think you can compare it to a material battle between nations. This is a matter that every man must think out in his own mind, and if men's minds are antagonistic, the differing parties must fight it out: and there can be only but one basis of peace, and that is truth. Until they arrive at that, there *will* be no peace; and there *should* not be. To get rid of this notion (which I am sorry to say Mr. Row has put forward more than once), that science as science is objected to by those who uphold revelation, I will bring Mr. Row to a definite test. He has referred to astronomy; but I will not go into that to-night, because I am going to read a paper on the subject in the course of the present session; and I want to bespeak the most extreme and bitter antagonism to what I shall then say, if I am wrong. But I will now pass on to geology, which in the present day has been more frequently placed at issue with theology than anything else, and Mr. Row has laid especial stress upon it. We shall see whether he will be able to answer this evening what I have now to say, and if not, whether he will do so at some other time. It will be placed on record in our *Journal of Transactions*, and if he does not answer it, all he has said on that subject must go for worse than nothing. Now I venture to say that

Mr. Row is not able to tell us what is now the orthodox geological theory of the creation or constitution of this world, nor is he able even to tell us that there is any extant theory that even professes to account for the creation or constitution of the world, since the recent geological theories were literally pulled to pieces. The great geological theory boasted of in Goodwin's essay on the Mosaic cosmogony in *Essays and Reviews*, was the nebular theory of Laplace. According to that theory, the nebular gas was cooled down into granite, which was the solid foundation on which all the sedimentary strata were deposited. That theory was wretched enough as it stood, for they never told us where the matter for such deposits came from ; but it has now been discovered that the granite itself is a transformed sedimentary rock ; and (as I stated in my reply to Professor Huxley) the geologists have as yet invented no new foundation, even as a theory, on which they could lay down their sedimentary deposits. They want a beginning. Perhaps Mr. Row can give us some theory which will supply one—

Mr. Row.—I did not lay down any theory whatever.

Mr. REDDIE.—Of course not ; and all these vague arguments from geology,—all these “bogies” theories of a gaseous world, must go for nothing. If Mr. Row wants us to give up the definite account of creation which we have in Genesis, on account of geology, he must surely say what theory geology has to supply us with in its place, and whether it is true or not. I put out this challenge in *Scientia Scientiarum* at the starting of this Institute, and not a single geologist has ever answered it. Mr. Row will not answer it :—he does not really know what to say. (Laughter.) It would therefore be much better to get rid of these general assertions that geology and theology contradict each other.—I also find that Mr. Row has several times in his paper read to-night contradicted himself—on the question of the infinite especially ; but the most able and clear remarks of Dr. Rigg must have satisfied you all on that subject. One point in the paper which I should like to notice has not been touched upon at all previously, and that is with reference to the origin of evil. Mr. Row says :—

“If we assume that God could have prevented it, and has not, we assign imperfection to His moral attributes ; if, that He was unable to prevent it, we limit either His power or His wisdom.”

I am glad to find a kind of contradiction to this in another passage of the paper, where he says that these deductions must only be the result of our own ignorance. But suppose we say that God could have prevented evil, and would not, because there was some higher reason for permitting it ; and you get rid of the difficulty altogether. It is to be regretted that this and one or two other points have been introduced into the paper unnecessarily, and not reasoned out ; for vague remarks on such subjects are to be deprecated. We have plenty of opportunity to discuss such questions ; and if Mr. Row will give us a paper on the origin of evil, and take either side, and reason it out, I shall be very glad. But I object to things of great importance being dealt with, as by a side wind, in this way. It is not satis-

factory, because we have no time to discuss them, and when such remarks slip in they may remain uncontradicted, on record in our *Journal*. I ought to say, before sitting down, as we are very much criticised out of doors, that Mr. John Stuart Mill is not the only person who has stated that two and two might make five. The *Saturday Review*, which is our great critic, once alleged the same thing. I am glad to find, however, that in a subsequent article it goes back to the fact that two and two are simply four, and cannot be anything else than merely four units ! (Hear, hear.)

The CHAIRMAN.—It seems to be considered right that the chairman should inflict himself on the meeting for a short time, and I therefore crave your indulgence while I execute the duty allotted to me. I can join most decidedly in the universal commendation given to the paper before us. I am rejoiced to find that my observations were not premature when I spoke of it at an earlier period as a thoughtful and interesting paper, for the discussion which has taken place has shown incontestably that it is both thoughtful and interesting. The two principal points which have been commented on by the various speakers have been faith and the Divine attributes. With regard to faith, I think Dr. Rigg was right when he said we use the word in too many different senses. We should have a definition of what we mean by faith. It seems to me that those who impugn revelation wish to distort "faith" into meaning something akin to superstition. Hume, in his essay on miracles, first argues on the impossibility of accepting a miracle on any evidence whatever, and then goes on to say scornfully that if we cannot accept it on evidence or on any rational premisses, we must accept it by faith. He thus endeavours unfairly to degrade faith into superstition. We may divide faith into faith moral and faith intellectual. Faith moral is concerned with action ; it is the faith of the infant, whereby it rushes into an apparent danger because its parent has told it that such apparent danger is no real one. In faith intellectual we accept the truth on less than pure demonstrative evidence. Where our love or affection is concerned, we acquiesce in something less than pure *αποδεικτικ*, something less than pure demonstration, and that is intellectual faith. As to the next point, namely, the attributes of God,—I would suggest to Mr. Row that there may be a certain amount of inaccuracy in our general language when we speak of the "attributes" of God. I do not read that God is a loving being : I read that God is love. The attributes of God—I speak reverently—are the Deity Himself. We do not attribute a quality to Him, but we know that He is that quality Himself. God is not merely just ; He is infinite justice. He is not merely pure, but perfect purity—

Mr. Row.—We read that He is holy.

The CHAIRMAN.—That is an instance of Scripture suiting itself to our popular way of speaking. What we call attributes are really the Deity, existing as the Deity Himself exists. It is not so with man, because his attributes are separable from him ; the virtuous man may cease to be virtuous, and the vicious man may become virtuous. The attributes of man are in a continual state of flux, but in the Deity all is immutable and

infinite. Now, how are we to get over that hopeless way of treating the infinite, Mr. Poyer spoke of, as the despair to which Dean Mansel's view of the infinite would lead us? We must meet it by looking to the only begotten Son of God. He has declared God by becoming man; in Him the infinite is made perceptible to the mind; the glories of Omnipotence are brought out and displayed in His human actions. We have in Him, if I may so speak, the exhibition of God to man in so far as man can comprehend Him:—the Word of God on earth was the translation of the Divine Word into the language of man. I hope the canon for the interpretation of Scripture which Mr. Row has referred to, will be drawn up. No better model for it can be formed than one quoted by St. Augustine from Tichonius the Donatist. It is in the *De Doctrina Christiana*, and more fully in the *Bibliotheca Patrum*, where it is couched in quaint language, which, however, is highly philosophical when properly interpreted. One word more on the subject of reason and faith. As I said before, the opponents of revelation wish to show us that faith is superstition, and that reason is not faith. Mr. Row has entirely proved in their teeth that reason and faith are but different phases of the same intellect exerting itself to grasp what it can of the Creator.

Dr. IRONS.—Would you say that the Deity has no distinction whatever in His own nature between purity and justice, and so on with all His attributes? If we are not to speak of the attributes of God, I must confess I am puzzled. It seems to me to destroy the whole character of the Divine Being, and to make Him a pure, simple abstraction without an idea of what purity and justice are.

The CHAIRMAN.—This is rather a question of language than of anything else. When we speak of the Deity we speak of a Being whose essence those qualities are; we may speak of Him in reference to this or that, as we please.

Dr. IRONS.—It strikes me this would lead straight to the pantheism of the Eliatics, and almost to the pantheism of the mediæval schools.

The CHAIRMAN.—That would be only if we conceived the attributes without conceiving the one Personal Deity Himself. In that case we should be erecting as many infinite beings as there are attributes.

Mr. Row.—I have very little to say in reply to the discussion which has taken place, as the objections to my paper have been so small. My object in regard to the question of infinity was to prevent the application of a quantitative measure. As I stated in the end, my paper is not an elaborate treatise: if it had been, I should have kept you here all night with it; and I can hardly exaggerate the difficulty I found in getting such a mass of matter into the space I have occupied. I could have written it five or even twenty times the length with much greater ease. It is the necessary consequence of such a condensation of material, that some things must be left obscure. With regard to the objection of Dr. Irons, the point he has raised is so small that it is hardly worth commenting upon. Two minds never can think exactly alike, I am quite aware; but Dr. Irons and myself really take an

exceedingly similar view. My idea of faith is that it belongs to almost every subject of human conviction : wherever there is conviction, there there is faith. It is not usual to say that axioms are the result of faith, but in one sense they are, and my only object on that point was to show that the 12th axiom of Euclid did require some trouble to comprehend it, and I do say it is not founded on distinct and intuitive truth. I have an old Euclid in which an attempt is made to demonstrate the axiom through several pages, and that only makes confusion worse confounded. (Laughter.) With regard to Mr. Reddie's objections, I had an idea of what he would say, and I read the other evening, since writing my paper, the following passage, written by Dean Howson, the dean of Chester, who is a man of very considerable mental power. Now, when I wrote the passage in my paper I had Mr. Reddie in my mind, for I think he is really a descendant of Ishmael—at least, I know that his hand is against every man, and every man's hand against him. (Laughter.) Dean Howson says :—

“A high estimate of Scripture being combined with a low estimate of Church authority, the two together lead to a technical view of inspiration, which, being asserted and not proved, is taken to be axiomatic. Through a certain impatience of thought, the proofs of the divine origin of Christianity are assumed to be *ipso facto* proofs of the verbal inspiration of the Bible. . . . In another direction also they have been much to blame, viz., in their treatment of the claims of science. Sometimes it seems to be assumed that scientific men are puffed up with pride, whereas scientific men are often very modest and humble. But it is the general mode in which science has been dealt with by the party, which must be especially pointed out as full of danger. Science is necessarily impatient of assumption. Induction can never stand still. Thus, if a fixed barrier is presented to scientific inquiry by traditional interpretations of Scripture, an uneasy state of mind cannot fail to result, with a tendency on the part of scientific minds to reject revelation, and a tendency too on the part of Biblical students to reject the Bible. Who can say what harm has been done by denunciations against geology which were heard years ago from some of our pulpits—denunciations which would perhaps now be willingly retracted by those who made them ? This ought to be a warning against precipitate assertion in regard to those ethnological and anthropological questions which are now causing anxiety. The wisdom of the Christian student is to wait quietly for the solution of problems in which science is concerned.”

Dr. IRONS.—What does he allude to ? Did you ever hear any one preach against geology ?

Rev. C. A. ROW.—Yes, certainly.

Mr. REDDIE.—Did you ever hear *me* preach against geology ? (Laughter.)

The Rev. C. A. ROW.—Yes, I think I have. (Laughter.) I occasionally accompany a friend of mine, who is a very learned man, living by his literary labours, and who devotes a portion of every Sunday to going out and combating the infidelity of London—the Bradlaughs and the men of that type,—and from what I have seen, I am certain there is very great danger to that

class of minds amongst which he goes from our continual small efforts to pick holes in science. We should rather endeavour to arrive at certain strong principles with regard to revelation on which we might take a firm stand. I do not know that I have anything more to reply upon, as the criticism has been so exceedingly favourable to my paper.

Mr. REDDIE.—But you have given us nothing as to the geological commencement of the world. (Hear, hear.)

Rev. C. A. Row.—I am not called upon to say what I believe. I say the periods of geology rest on very high probability, and you must wait for the present.

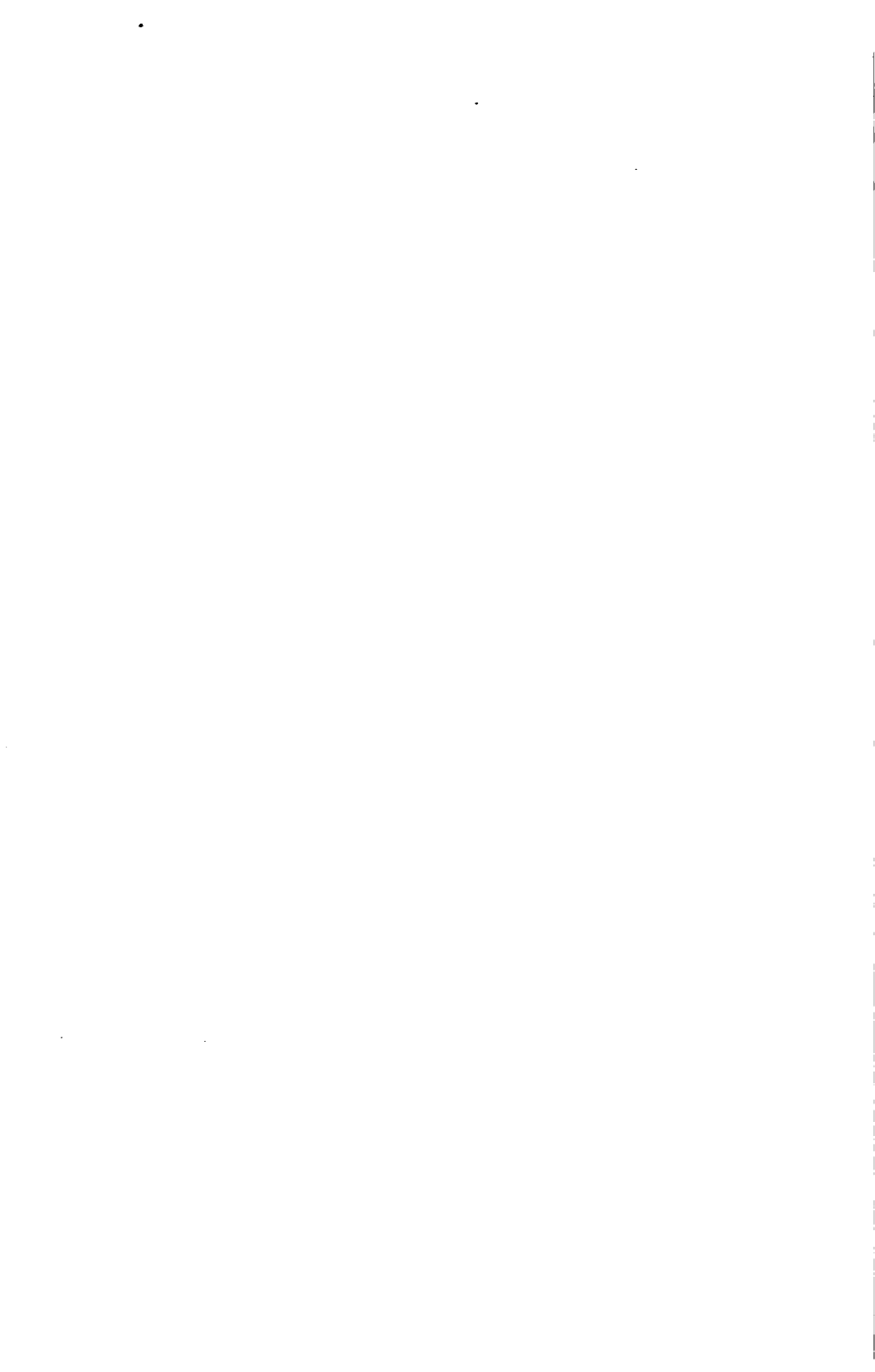
Mr. REDDIE.—By which you mean that the science of the world rests upon chronology?

Rev. C. A. Row.—Ninety-nine out of every hundred geologists think that 8,000 years is too narrow an amount of time for the existence of the world. I think that the enormous preponderance of geological evidence gives us a right to assume the probability of that view. It may be true or it may not.

Mr. REDDIE.—But you have not noticed the fact that the long geological periods were based on the nebular theory; geologists thought that the immense heat, which they had assumed, would take all that long time to cool down. But the nebular theory has now gone.

Rev. C. A. Row.—It would be ridiculous in me to attempt to go into this question; it has nothing to do with the paper. I only wanted to establish some sound ground for believing in revelation, and for not constantly running our heads against science.

The meeting was then adjourned.







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